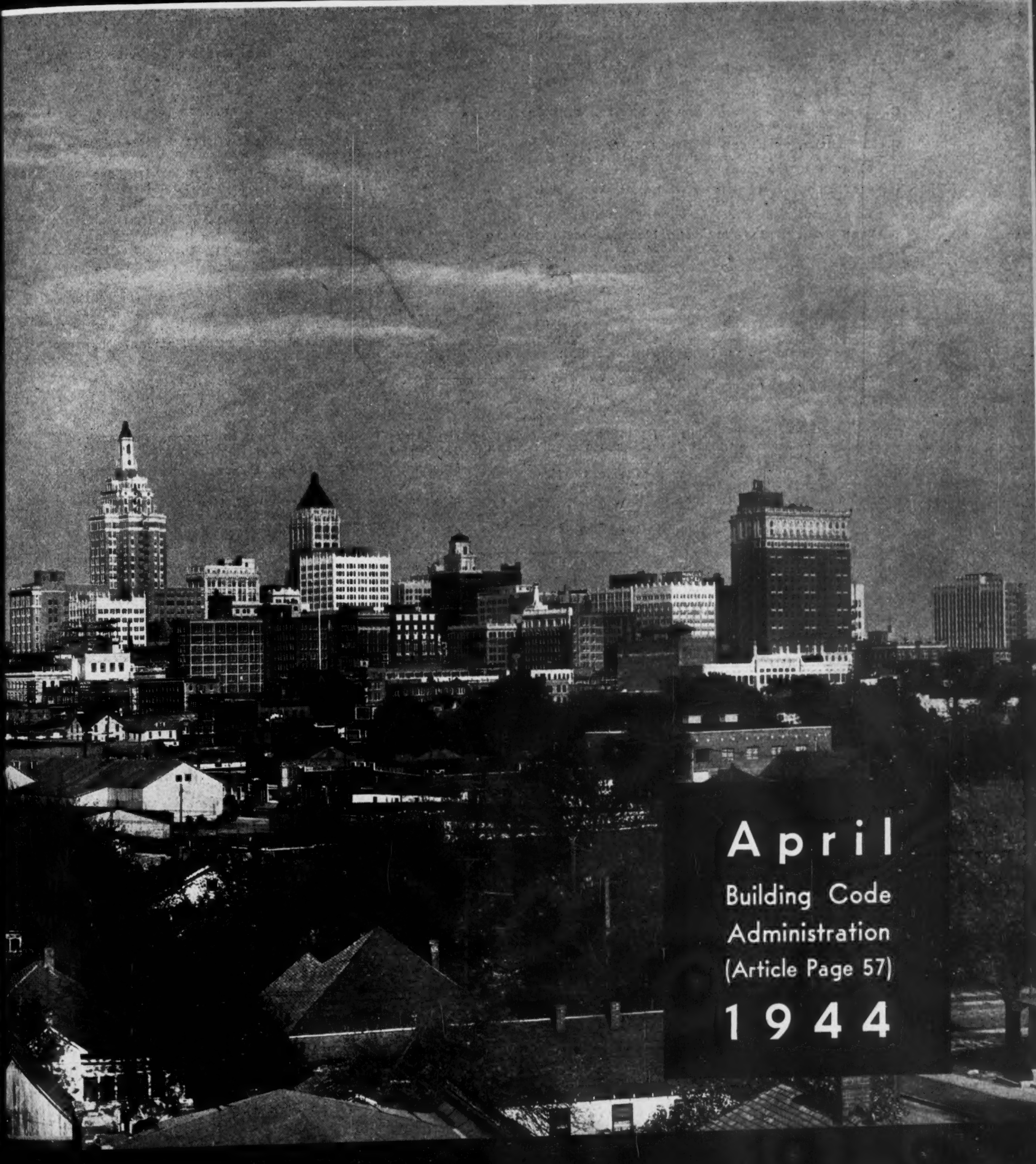
Industrial Standardization



April

Building Code Administration

(Article Page 57)

1944

American Standards Association

Industrial Standardization

Published Monthly by

American Standards Association

29 West 39th Street, New York 18, N. Y.

RUTH E. MASON, Editor

Our Front Cover: Tulsa, Oklahoma. *Photograph by Charles Phelps Cushing.*

This Issue

The Pictures—Cover, Charles Phelps Cushing; 59—U. S. Bureau of Labor Standards and National Safety Council; 68—Bachrach; 76—Charles Phelps Cushing.

ASA

Reg. in U.S. Pat. Off.

Standardization is dynamic, not static. It means not to stand still, but to move forward together.

Subscription price $4.00 per year (foreign $5.00); Special to schools and libraries $2.00 (foreign $3.00); single copies 35 cents

April, 1944 Vol. 15, No. 4

Re-entered as Second Class Matter July 31, 1943, at the Post Office at New York, N. Y., under the Act of March 3, 1879.

Standards and Manpower

Says *Business Week:*

> "Donald Nelson, in reporting that February war production about equaled that of January, declared that . . . the country's efficiency, as measured by war output per manhour, shot up 33 percent in the two years after Pearl Harbor. But this striking gain wasn't really a surprise to production experts."

Nor was it a surprise to standardizers!

More and more, standards—and especially unified standards—are being used to smooth out the kinks—in subcontracting—in inspection—on the production line.

Every day since Pearl Harbor more men have come to understand the basic role which standards play—from the raw materials for the processing plant, to final assembly and inspection. Army and Navy are driving hard to unify their specifications with each other and with industry as a means of increasing production, and attaining ever higher efficiency in handling materiel problems.

The far-seeing industrial manager recognizes standardization also as an essential element in post-war development. His solution of reconversion problems, his design of new products, the speed and efficiency of new production—even the pricing of his post-war product to the consumer and his solution of employment problems—will be affected by his standardization policies.

Standards to Help In Building Code Administration

by J. H. Courtney[1]

Secretary, ASA Building Code Correlating Committee

APPROVAL by the American Standards Association of the American Standard Administrative Requirements for Building Codes (A55.1-1944) developed under the leadership of the American Municipal Association and the Building Officials Conference of America, Inc, adds to the growing list of standards in the building code field one that deals with a rather important phase of the problem.

Standards previously approved by the ASA in this field have dealt almost entirely with technical phases of codes, such as materials, their quality, and requirements for their use in building construction; mechanical equipment; and special items of construction such as grandstands and building exits. The new standard deals with the administrative features of building codes, that is, with the organization of the building department, and the enforcement of the requirements and intent of the building code.

Standard Administration Impossible?

It has been said that standardization of administration is impossible since administration implies organization and organization involves an assignment of duties to individuals whose capabilities may vary greatly. In the sense that standardization of administration as applied to a municipal building department means to specify every detail of the departmental organization and the duties of every employee, the statement is perhaps correct, although the word standardization as used in that connection is ill-chosen. In the sense that standardization of administration means to define in broad terms the powers, duties, and responsibilities of the enforcing official, leaving the details to be developed as a matter of office routine, there appear to be no more valid reasons for not standardizing the essential features of code administration than there are for not standardizing on qualities of materials or many other items of building codes.

The approach in the present standard is from this latter viewpoint. The standard sets forth in general terms the scope of the code, which includes both new and existing buildings. It provides for the establishment of a building department, sets up desirable qualifications for the head of the department, who is called "the building official," and specifies the organization of the department only to the extent of giving the building official power to appoint the necessary deputies, inspectors, and other employees.

The powers and duties of the building official are described, particular attention being paid to unsafe buildings, one of the more troublesome of the building official's many problems.

New Methods and Materials Considered

New materials and new methods of construction are given attention in the section of the new standard which deals with the powers and duties of the building official, since these are matters which are expected to be of real importance to the building official in the post-war period. War-time developments which have speeded up construction or effected economies may be expected to be carried over into the anticipated post-war building boom and it is essential that codes be made flexible in this respect in order that builders may benefit from such developments as have proved their worth.

One power given to the building official in the new standard, that of making rules to carry into effect the provisions of the code, is not commonly found in building codes. There is some difference of opinion among building officials as to the legality of a provision which gives such power to the enforcing officer, but many experienced officials believe it to be a proper and necessary power. It is not the intent of the provision to give the building official the power to write new legislation into the building code. Such power would be held by the courts to be an improper delegation of authority. Rather, the intent is to give the building official the right to adopt and promulgate rules and regulations which provide the details necessary to supplement the statutory provisions.

May Refer to National Standards

To illustrate, the code might properly require that materials shall be of a quality to meet the intent of the code and shall conform to specifications consistent with the code requirements, such specifications to be promulgated as rules by the building official in accordance with the procedure prescribed in the administrative section of the code. The building official would then issue rules requiring materials to conform to stated nationally recognized standards. The advantage of such a procedure is that it permits the code to be kept up to date without going through the rather cumbersome process of amending the code each time the nationally recognized standard is revised. The rule-making power is safeguarded

[1] Washington Representative, American Standards Association.

by requiring that notice of intent to adopt rules shall be duly published, and by providing for public hearings on the rules.

Applications for permits and the issuance of permits are covered in the new standards, although no attempt is made to draw up standard forms for these operations. However, the committee has indicated the essential information that should be furnished on the application for permit, leaving to the building official the preparation of the proper forms for the transactions. One feature of this section is the provision that examination of structural details of plans may be waived by the building official when the architect or engineer for the proposed structure presents an affidavit to the effect that the plans and design conform to the requirements of law, and an agreement that upon completion of the structure he will submit a certification that the structure has been erected in accordance with the code. The purpose of this provision is to relieve the building department to some extent of the burden of checking plans and to place the responsibility for safe design upon the architect or engineer where, in the opinion of many building officials, it properly belongs.

Building Occupancy Changes Cause Problems

Another feature of the new standard is the provision for a certificate of occupancy. Changes in occupancy without notice present a serious problem to the building official because the changes so often involve the use of a building by an occupancy which may cause much heavier loads to be imposed on the building than those for which it was originally designed. By requiring that no new building shall be occupied and no change in the occupancy of an existing building shall be made until after a certificate of occupancy has been issued, the committee believes that the control of the building official over such conditions will be strengthened. Such control is not new to many codes and the use of the certificate of occupancy appears to be increasing. The committee believes its use should be encouraged.

Disputes between the applicants for permits and the building department frequently arise over questions of interpretation of the code requirements, or refusal of the building official to accept a particular material or a special method of construction. Provisions for the establishment of a board of appeal to pass on such disputes are included in the new standard.

Requirements for fees have not been included in the standard. Practice in respect to fees varies so widely that the committee was of the opinion that the matter should be left to local policy. An appendix discussion is presented, however, in which the arguments for and against fees are set forth, as well as examples of some of the more common methods of determining fees. Likewise, because of the wide variance in methods of enforcing laws in different states, no penalties for violations of the code have been recommended by the committee. A discussion of methods of enforcement and of penalties is presented in an appendix to the standard.

The American Standard Administrative Requirements for Building Codes was prepared by ASA committee A55 working under the sponsorship of the American Municipal Association and The Building Officials Conference of America, Inc.

The members of this committee are:

Edward W. Roemer, Building Officials Conference of America, Inc, *Chairman.*

American Institute of Architects, *Frederick G. Frost, Sr; Theodore I. Coe (alternate)*

American Municipal Association, *Albert H. Hall*

American Public Works Association, *Loran D. Gayton*

Associated General Contractors of America, Inc, *George Griffing*

Building Officials Conference of America, Inc, *Edward W. Roemer*

Federal Security Agency, Public Health Service, *M. Allen Pond*

International Association of Governmental Labor Officials, *Herman B. Byer*

International City Managers' Association, *Harold W. Baker*

National Association of Real Estate Boards

National Board of Fire Underwriters, *C. T. Bissell*

National Bureau of Standards, *George N. Thompson; Vincent B. Phelan (alternate)*

National Housing Agency, *Gilbert L. Rodier; Howard P. Vermilya; Earl W. Macy (alternate); R. J. Wadsworth (alternate)*

New England Building Officials Conference, Inc, *William J. Ennis*

Members-at-large: *William F. Hurd; Frank C. Keller; Robert Knight; Andrew C. H. Leak; Walker S. Lee; Arthur N. Rutherford; Clifford M. Stegner*

The American Standard Administrative Requirements for Building Codes (A55-1944) is available from the American Standards Association at 35 cents per copy.

The American Standard Building Code Requirements for Masonry (A41.1-1944), announced in the March issue of INDUSTRIAL STANDARDIZATION, is available in the ASA building code format at 50 cents per copy. Copies are available from the National Bureau of Standards (sponsor) in a government format at 10 cents.

ASA Collects Data On Uruguayan Draft Standards

The standards institute of Uruguay (Instituto Uruguayo de Normas Tecnicas, UNIT) has requested the American Standards Association to collect comments from United States experts on the two Provisional Standards listed below. This is in line with the program of inter-American cooperation on standards being carried out between the standards bodies of the Latin-American countries and the American Standards Association. The two new Provisional Standards on which the American Standards Association is collecting comments are:

16-P Concrete Pipes
23-P Physical Tests of Textiles

Copies of these proposed standards may be borrowed from the ASA Inter-American Department, or photostat copies may be purchased at the price of photostating. This amounts to 40 cents per page. Uruguayan Provisional Standard 16-P has 7 pages; 23-P has 3 pages.

Can Injuries In Woodworking Be Prevented?

New American Standard Tells How to Protect Workers

by Whitney S. Gardner[1]

Chairman, ASA Committee on Safety Code for Woodworking Machinery

A Wood Shaper with Guard

A cage or other guard, which will keep the operator's hands away from the cutting edge is recommended by the standard for all wood shapers.

HIGH-SPEED machinery with swiftly moving, sharp cutting edges; dust; insecure footing; crowded spaces; and inadequate illumination are some of the inherent hazards of the woodworking industry. Many of these hazards have been eliminated or controlled, but there is still much to be accomplished. Add to these the personal factors of inexperience, lack of training, disregard of instructions, and general lack of skill or adaptability and we have a fair cross-section of the accident problem in an industry which produces relatively few occupational fatalities but an unusually high frequency of permanent disabilities—one in every 20 injuries.

What constitutes proper guarding of woodworking machinery has been a controversial question for a long time. The fact that there are numerous types of machines and that each machine is used in a variety of ways has caused serious difficulty in the past when efforts have been made toward general protection of the operator. In some cases a guard used for one purpose must be removed when the machine is operated for another purpose. A hood mounted on a spreader, for example, can be used when the material being cut extends beyond the sides of the saw table, but it is not practical when the machine is used for grooving, dadoing, or rabbetting operations.

Carelessness Important Accident Factor

In addition to accidents caused by lack of guards, environment, inadequate training, violations of instruction, haste, and other factors contribute to many injuries. Although repeatedly warned, employees often disregard well-founded instructions and use hands instead of a pusher in guiding narrow strips, or fail to use a stick to remove scrap and pieces near the saw or cutting head. An operator may, in haste, shut off the power but fail to wait for the saw to stop rotating before cleaning it or making adjustments. Since some foremen do not emphasize the value of guards, the removal or non-use of guards has also resulted in many amputation accidents.

At present, however, many machines are not properly guarded, although it is well known that accidents can be prevented through use of efficient protective devices.

Work Started on Safety Code in 1920

To meet the challenge of these industrial hazards, the National Conservation Bureau and the International Association of Industrial Accident Boards and Commissions organized a sectional committee under the procedure of the American Standards Association. This committee began work on the Safety Code for Woodworking Plants (O1) in 1920. The first edition of the standard was approved four years later.

This code provided a consensus as to expert experience and general good practice for guarding woodworking machinery but applied only to machinery used in woodworking plants. A revision, completed in 1930, remained without change until recently, when it was decided to again revise the code and to include woodworking machinery regardless of where it is used.

Suggested revisions of this new code were assembled, and a subcommittee met in Washington early last year to consider them. This subcommittee weighed each suggestion and recommended which should be included in the code. A draft was prepared which, after approval by the sectional committee, was submitted to the ASA by the sponsor organizations.

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[1] Assistant Superintendent, Safety Engineering Department, U. S. Fidelity and Guaranty Company.

The newly revised standard, American Standard Safety Code for Woodworking Machinery (O1.1-1944), sets minimum requirements for safeguarding the operator of a woodworking machine wherever it may be used. For the first time, the standard places the emphasis on the machines rather than on woodworking plants in general, because the more common woodworking machines, such as circular saws, band saws, and jointers (these last among the most hazardous of all woodworking machines) are found in most industrial plants and in many mercantile establishments. There they are used in maintenance work, crating, and incidental manufacturing not covered in the scope of the original standard.

To protect the workers, the American Standard specifies that where there is possibility of contact with the portion of the saw either beneath or behind the table, that portion of the saw should be covered with an exhaust hood. If no exhaust system is required, then it should be covered with a guard so arranged as to prevent accidental contact with the saw. The standard also requires that each hand-fed circular rip-saw be provided with one or more non-kickback fingers or dogs mounted on the hood. These dogs are located so as to oppose the tendency of the saw to pick up the material and throw it back towards the operator. Spreaders should be provided for each circular hand-fed ripsaw to prevent material from squeezing the saw and thus being hurled back at the employee.

> The new American Standard Safety Code for Woodworking Machines was prepared by ASA committee O1 working under the sponsorship of the International Association of Industrial Accident Boards and Commissions and the National Conservation Bureau.
>
> The members of this committee are:
>
> W. S. Gardner, National Conservation Bureau, *Chairman*.
>
> Associated Cooperage Industries of America, *Louis F. Horn*
> Association of Manufacturers of Wood Working Machinery, *F. G. Walker*
> Industrial Safety Equipment Association, *Roland Jones; A. O. Boniface (alternate)*
> International Association of Governmental Labor Officials, *J. T. Faust; C. H. Gram; Lewis P. Sorrell (alternate)*
> International Association of Industrial Accident Boards and Commissions, *R. McA. Keown*
> National Association of Furniture Manufacturers, Inc, *J. C. McCarthy*
> National Association of Mutual Casualty Companies, *Robert C. Barr*
> National Bureau of Standards, *Stewart J. Owen, Jr; J. A. Dickinson (alternate)*
> National Conservation Bureau, *W. S. Gardner; F. X. Eaton (alternate)*
> National Electrical Manufacturers Association, *L. F. Adams*
> National Lumber Manufacturers Association, *L. W. Smith*
> National Safety Council, *James G. Aldrich*
> Southern Pine Association, *Ernest A. Merklein*
> U. S. Department of Labor, *M. A. Hutcheson; O. Wm. Blaier (alternate); Max Perlow; Harold Pritchett; Harold Ware*
> U. S. Department of Labor, Division of Labor Standards, *R. P. Blake*
> Upholsterers' International Union of North America, *S. B. Hoffman*
> Veneer Association, *Frank L. Montgomery*
>
> The American Standard Safety Code for Woodworking Machinery (O1.1-1944) is available for 35 cents from the American Standards Association, 29 West 39 Street, New York 18, N. Y.

Saw Speeds Should Be Considered

In the prevention of accidents, saw speeds should be taken into consideration. Circular saws, according to the standard, should not be operated at speeds in excess of 10,000 peripheral feet per minute unless tensioned for higher speeds. In that case, the manufacturer should etch upon the saw the maximum speed at which it should operate.

A common accident on band resaws is caused by the hands of the operator coming in contact with the in-running feed rolls. This can be prevented by the installation of a semi-cylindrical guard, the standard recommends.

The standard also provides for barriers or adjustable guards around cutting heads of each wood shaper, hand-fed panel raiser, or other machine not automatically fed.

Workers around veneer machinery are faced with still other hazards. In order to prevent them from falling into steam vats and soaking pits while loading and unloading, the standard recommends that either non-slip shoes or safety belts attached to life lines be used. The standard also suggests a third alternative—that the logs be removed mechanically from the vats after the liquid has been drained, and that no assistance be required from the employee.

Heading bolters, used in cooperage operations, should have the saw enclosed to prevent accidental contact. In order to cover the portion of the saw which cannot be enclosed by a stationary housing, it should have a hood fastened to the back of the block carrier. Specific guard requirements are also laid down for single and double stave planers, stave and heading jointers (matchers), stave croziers, and barrel sanding machines.

Crowded Conditions a Hazard

Many accidents have been caused through crowded conditions, and machines placed too closely together. The woodworking code holds that the location of machines should be such that there will be sufficient space in which to handle the material with the least possible interference from or to workmen or machines. These machines should be so placed that it will not be necessary for anyone to stand in an aisle, or so near an aisle as to be liable to accidental contact by passing workmen, hand trucks, or other moving objects.

The guards specified in the woodworking code will give adequate protection to anyone who might accidentally fall against or come in contact with such a guard. However, the committee could find no technical data or reports of tests to show that these hoods were properly designed to hold or retain a broken or loose knife blade if it should fly out of the head when the machine is in motion. In the interest of greater safety, the committee recommended that research to determine the proper design of such hoods be made by a recognized testing laboratory. The results of this study will be included in future revisions of the woodworking code.

A discussion of the rules and also suggestions for putting the rules into effect are included in the appendix to the standard. Minimum distances between machines, and clearance on each working side of the machine are recommended. This section also discusses cracked circular saws, maintenance of all saws, and specifications for spreaders. Sketches of the typical guards included in the standard illustrate more clearly the methods by which safety may be obtained for all workers using woodworking machinery.

Traffic Engineers' Signal Standard Becomes American Standard

An improved standard for the mechanical equipment which controls the red and green traffic signals on busy street corners in cities and towns all over the United States was approved recently as an American Standard. This standard covers in detail the design, performance, and construction specifications for pre-timed, fixed cycle, traffic signal controllers. It was developed by the Institute of Traffic Engineers, and has been well tested in use.

The standard is divided into five sections, the first of which is concerned with design, setting forth the minimum requirements for the traffic signal controllers of the various types included in the specifications. Section two deals with the functional requirements which apply specifically to non-interconnected controllers (or to controllers for isolated operation). Section three sets forth certain functional requirements which apply specifically to controllers designed for temporary operation in a non-interconnected traffic control signal system. These controllers shall also be designed for easy and inexpensive conversion to inter-connected controllers of a specified type described in section four. Section four also discussed the functional requirements which apply to the inter-connected type of controller. The fifth and last part of the standard pertains to the functional requirements which apply specifically to a Master Controller. There is also a section defining the terms used in the field.

The Institute of Traffic Engineers' Committee on Standards and Specifications which prepared the standard, was headed by William C. Brandes. The standard is a revision of the Tentative ITE Standard Specifications for Pre-Timed, Fixed Cycle Traffic Signal Controllers published in the 1941 Traffic Engineering Handbook.

This standard should prove to be of especial interest to all those concerned with traffic management. It may be obtained for 25 cents a copy from the American Standards Association, 29 West 39th Street, New York 18, N. Y.

Bernice S. Bronner Joins ASA as Textile Technologist

Bernice S. Bronner, formerly head of the textile laboratory of the Good Housekeeping Institute, has joined the staff of the American Standards Association with the title of textile technologist. Miss Bronner, who is already familiar with the activities of the Association through service on ASA committees, brings to her new work a rich background of experience in the home economics field.

As head of the Good Housekeeping Institute's textile laboratory, she assigned and supervised all physical, chemical, and wear tests; wrote textile editorials for *Good Housekeeping Magazine;* and checked textile copy offered for advertising.

Before her affiliation with Good Housekeeping Institute, Miss Bronner was with Brown Durrell Company, hosiery and underwear distributors. Here she set up a testing laboratory for hosiery and lingerie, wrote specifications, supervised testing of goods, and visited stores to teach saleswomen how to sell.

For several years Miss Bronner has also taught a class in "Fabrics" at the Tobe-Coburn School for Fashion Careers.

Miss Bronner is a graduate of the New York State College for Teachers and is secretary of the American Association of Textile Technologists. She is active on the Membership Committee of the American Association of Textile Chemists and Colorists, a member of the American Home Economics Association, and a member of the well-known ASTM Committee D-13 in charge of specifications for textile materials.

What Codes and Standards Mean to Us[1]

by E. C. Barnes

Industrial Hygiene Engineer, Westinghouse Electric and Manufacturing Company

THERE are obviously many advantages to standardization, particularly in the many manufacturing operations carried out in our plants. There is a real advantage in being able to obtain standardized parts such as lamps, bolts, wire, and motors. The use of standardized equipment and parts contributes to the safe operation of any manufacturing plant.

During the years, many codes and standards have been developed by various associations and societies, and many of these include information which is vital to the safe operation of an industrial plant. The American Standards Association now has 600 approved standards available for use by industry, consumer, and governmental groups. Included in this number are many codes and standards which specify safe operating methods and equipment. Many other national groups, such as the American Society for Testing Materials, National Electrical Manufacturers Association, and National Bureau of Standards have issued codes and specifications which are directly applicable to the problems of the safety engineer. An inspection or test procedure which will insure safe and satisfactory operation of equipment is frequently specified.

Wealth of Safety Data in Standards

Our plant engineers, supervisors, and safety engineers are frequently faced with problems of protecting employees against a hazard which they may not fully understand. Guarding for various types of machines may be necessary, a ventilation system may be required, or personal protective equipment may be necessary for the workmen. In the various codes and standards, there is a wealth of information which can be used by all who are concerned with the health and safety of industrial employees.

In many instances, these codes represent the work of a committee for a period of several years. The committees are usually composed of men who are experts on the subject being considered. A broad representation of the different interests involved in the formulation of a Code or standard is usually included. Many of the codes are revised periodically and in this manner they include up-to-date practices which are known to help in the prevention of accidents. It would seem essential that all persons who are interested in industrial safety should make use of the helpful informatio to be found in the various codes and standards. Th following are several examples:

What concentration of benzol is permissible in air breathe by workmen? — One hundred parts per million is the standar established by American Standard Z37.4[2].

What type of eye protection is required for chipping an grinding where relatively large flying objects are present? — Th American Standard Safety Code for the Protection of Heads Eyes, and Respiratory Organs,[3] National Bureau of Standard Handbook H24, gives rather complete information.

What kind of pipe should be used for the piping of oxyge and acetylene? — The Safe Practices for Installation and Opera tion of Oxy-Acetylene Welding and Cutting Equipment, pre pared by International Acetylene Association, New York City recommends non-ferrous pipe for high-pressure oxygen and onl steel or wrought-iron pipe for acetylene.

In addition to the codes and standards issued b various national associations, the Departments of Labo in various states have established regulations or code which outline the minimum requirements for safe op eration of equipment or processes within that state Such regulations or codes should always be given ap propriate consideration. Inspectors from the Arm Service Commands use various codes or standards as basis for determining whether safe operating condi tions are being maintained.

A liberal education in safety engineering can be ob tained by a close study of the various codes and stand ards which are available. We will be glad to furnis information as to how and where the various codes ca be obtained.

1 Reprinted from "Safety News", published by the Westinghouse Electric and Manufacturing Company.

2 Z37.4-1941.

3 American Standard Z2-1938.

Arthur M. Houser Retires from MSC

Arthur M. Houser, member of the ASA Standard Council since 1930 and of the Mechanical Standard Committee since its organization, recently retired fro active duty. Mr. Houser was first associated with AS work in 1919 as a member of the Sectional Committee o Pipe Threads (B2). Until his retirement, he was activ in eight of the ASA sectional committees as well as i the work of the Standards Council and the MSC. Be fore his retirement, he was Engineer of Standardizatio of the Crane Company, and he remains with the com pany in an advisory capacity.

Mr. Houser has represented the Manufacturers Stand ardization Society of the Valve and Fittings Industr and the American Society of Mechanical Engineers o the Mechanical Standards Committee and the Standard Council of the ASA.

New Developments in

Standards For Ball and Roller Bearings

Committee to advise ASA on method to follow in future work on standards for bearings

Representatives of industrial and government organizations concerned with the manufacture or use of ball and roller bearings were called together by the American Standards Association at a general conference April 11 to determine how the standardization work on ball and roller bearings in this country should be handled in the future.

In 1920 a project on standardization of ball bearings had been initiated under the procedure of the American Standards Association, and sponsorship for this work had been assigned to the Society of Automotive Engineers and the American Society of Mechanical Engineers. Later, the scope of this project was broadened to include roller bearings. Under this project, standards for four types of radial ball bearings have been approved, but the project has been inactive since 1933.

In addition to a discussion of the status of the work in the United States, the conference heard Dr. H. Törnebohm, president of the Swedish Standards Association and a world authority on ball and roller bearings, describe the efforts toward international unification in this field which have been made in Europe during the past 20 years, and the results achieved. Dr. Törnebohm briefly outlined a general plan of basic dimensions for ball and roller bearings adopted in Europe as a guide for the machine designer. Countries in which the plan is used include Russia, Sweden, Germany, and Switzerland. Adherence to this outline of dimensions prevents the growth of an excessive variety of types and sizes of bearings, which would be uneconomic to both manufacturers and users. He suggested that this plan be given consideration also in the American national standardization work on ball and roller bearings undertaken in the future.

Dr. H. S. Osborne, chairman of the ASA Standards Council, who presided at the meeting, appointed a temporary committee to go into the matter further. This committee is to make recommendations on the methods of handling the national standardization work, as well as on the relationship of this work to the international plan of unification suggested by Dr. Törnebohm. Members of this committee are listed in the box on page 65.

Dr. Törnebohm's outline of the work on international unification of ball and roller bearings in Europe during the past 20 years is reproduced below.

International Unification of Bearings

by Dr H. Törnebohm

President, Swedish Standards Association

THERE are few elements in the machine industry that are so well fitted for standardization as anti-friction bearings, or where the advantages of standardization are so obvious.

If a special screw is needed, it takes but a short time to manufacture it, but if a special bearing is needed to replace an old one, it sometimes takes months to make it.

An anti-friction bearing is a complicated product to manufacture, requiring special tools, apparatus, intricate tolerance specifications, inspection devices, etc, and such manufacture can only be profitable on a large-scale basis.

It is well known that when ball bearings of modern design were introduced in the late nineties, they were already listed as "standardized elements." Even then it was clear that there could be no success if all groups using bearings were to design these themselves, as in many cases user groups were doing with other machine elements at that time. It is also well known that the dimensions of the first listed DWF bearings were taken

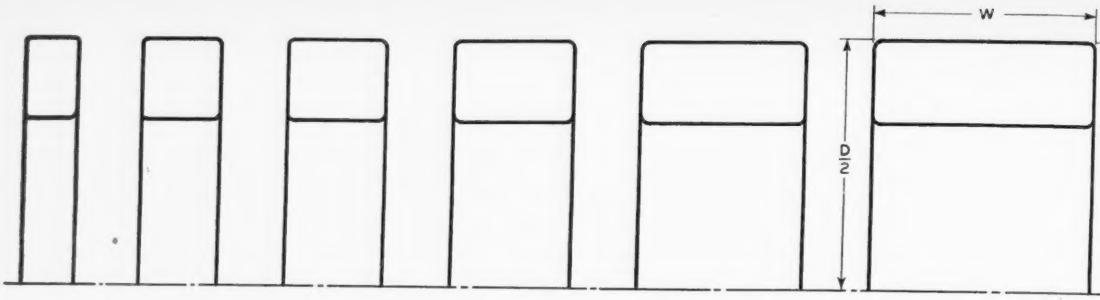

Fig. 1—Six radial bearings having the same bore B, the same section height H, and hence, the same outside diameter D. The width W is different in each of the six cases.

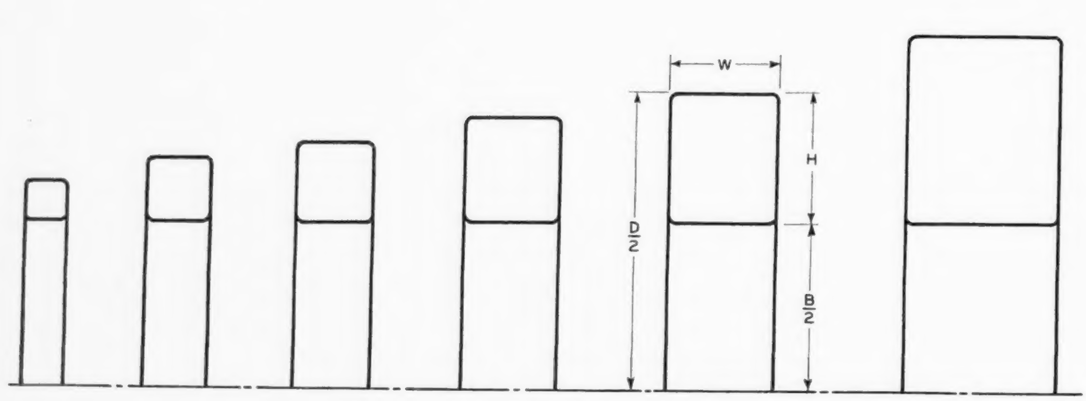

Fig. 2—Six radial bearings having the same bore B, but a different section height H and width W. However, the ratio between the width and the section height is the same in all cases.

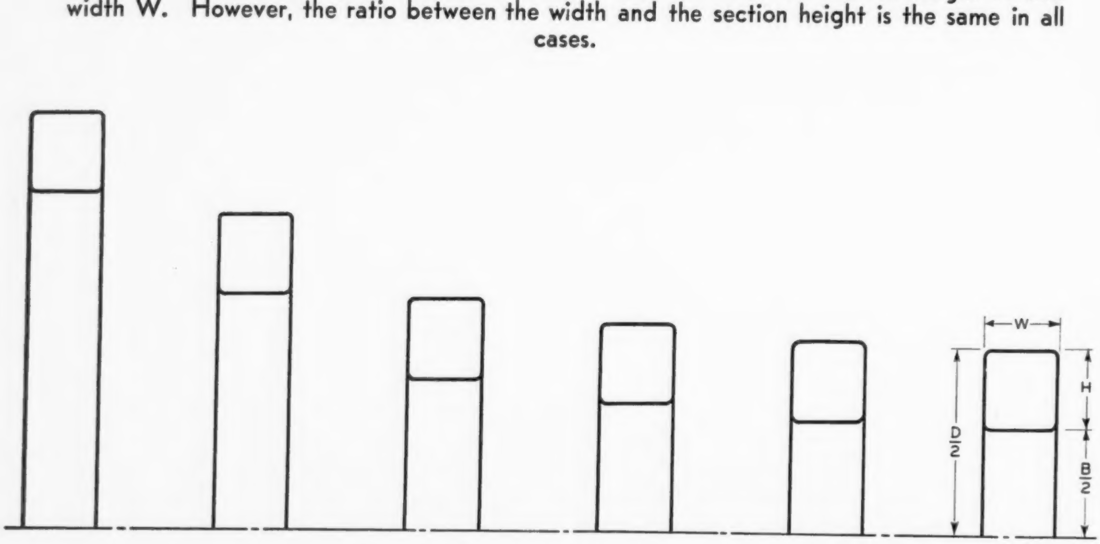

Fig. 3—Six radial bearings having a different bore B, but the same section height H and width W. The internal and external races of all these bearings have the same cross-sectional contours which can be produced with the same tools and checked with the same gages, independent of the size of the bearing.

Basic Layout of Boundary Dimensions of Ball and Roller Bearings

The basic layout of boundary dimensions of ball and roller bearings explained by Dr. Törnebohm applies (a) to existing dimensions already adopted for standard bearings, and (b) to dimensions of bearings of new design still to be developed.

European countries have found, Dr. Törnebohm indicated, that adherence to this basic layout keeps down the total variety of bearings, thus making for economy in production without cramping the designer. This will be clear from the three diagrams shown above which indicate how the basic plan can be used for developing different series of bearings having common characteristics.

over by other bearing manufacturers in Germany, as well as in other countries, including the United States. A certain degree of international unification was thus automatically established before the first World War.

During that war, the necessity of standardization for effective war production and for maintenance behind the fronts became increasingly obvious, and resulted in the creation of national organizations responsible for such standardization in each country. In this country, the American Standards Association was founded in 1918. Similar organizations were founded in Germany (DNA, 1917); in Switzerland (VSM, 1917) and in Sweden (SIS, 1917).

National Bodies Developed Bearing Standards

Every industrialized country built up its own organization, working for standards that would benefit its industries and help increase the standard of living. (In Great Britain, a national organization, now called the British Standards Institution, had been founded in 1901.) For reasons already mentioned, the question of standardization of anti-friction bearings was among the first to be taken up by these organizations.

In this country, the Society of Automotive Engineers took up the problem, but confined itself to declaring as standards the dimensions already used in the automotive field. No sizes over 110-mm bore were listed.

In Germany, proposals were submitted which, if they had materialized, would have meant a change of almost all existing dimensions. The Germans tried to get rid of certain odd numbers, such as 37 and 47 mm, and to have them changed to something called "nominal diameter sizes," already agreed upon for other products.

In Great Britain, Switzerland, and Sweden, other proposals for national standards were prepared.

This development thus seemed to lead toward different standards for each individual country. Soon the men working on standardization of anti-friction bearings began questioning the wisdom of this national diversity, and the idea of international unification became stronger. This idea eventually led to the organization of the International Standards Association in New York, in 1926. A technical committee on Ball and Roller Bearings (ISA 4) was one of the first of the international standards committees to be organized, and it was decided that the Swedish Standards Association should act as its secretariat.

First International Conference in 1923

However, even before this ISA committee was organized, an important basis for international unification in the anti-friction field had been laid. This was in the form of conferences that were held quite informally in connection with conferences of secretaries of various national standardization bodies.

The first of these conferences was held in Zurich, Switzerland, in 1923 and was attended by Mr. Wikander from this country, Mr. Gohlke (Fischer Ball Bearing Company, Schweinfurt, Germany), Mr. Zollinger, from Switzerland (who, to my great sorrow, died several months ago), and myself, from Sweden. At that time we agreed in principle that the future standardization work should be based upon maintaining the dimensions of the popular sizes of ball bearings then existing in our respective countries. We also agreed that the new German proposal should not be adopted, and this was entirely dropped from future consideration. The decisions were further confirmed at a meeting in Berlin held later in 1923, and again in Zurich in 1925.

Committee to Make Recommendations on Ball and Roller Bearings

Members of the committee which will make recommendations to the American Standards Association as to the methods by which national standardization work on ball and roller bearings should be handled in the future, and the relationship of this work to the international plan, are as follows:

H. O. Smith, Anti-Friction Bearing Manufacturers Association, *Chairman*
L. F. Adams, General Electric Company
A representative of the Bureau of Ships, U. S. Navy
R. S. Burnett, Society of Automotive Engineers
Harold DeJong, Sperry Gyroscope Company
T. C. Delaval-Crow, New Departure Division, General Motors Corporation
Lieutenant Colonel G. R. Gaillard, Army-Navy Aeronautical Board
B. P. Graves, Brown and Sharpe Manufacturing Company
H. Leader, Bell Aircraft Company
C. B. LePage, American Society of Mechanical Engineers
Don Loeber, Eclipse Aviation Division, Bendix Corporation
Colonel B. L. Neis, War Department

At the meeting in New York in 1926, the standardization of anti-friction bearings was discussed not only with a view to the organization of the work, but also as a technical problem. A preliminary program for Technical Committee ISA 4 was laid out. It was also decided that a subcommittee should be appointed to meet in Stockholm during 1927, and this was done. Furthermore, some discussions were held as to what should be done about thrust bearings, a standardization question of vital importance which, in order to be solved from an international point of view, required consideration of important changes in existing dimensions, as there seemed to be quite some confusion in the different countries and among different manufacturers.

It would be tiresome, indeed, if I were to give you even a short picture of what has been done during all the conferences held by the ISA 4 committee. I only want to tell you that we must have had an international meeting at least every year, or every time that ISA conferences were held.

Thrust Bearings and Tolerances

In Stockholm we had a very intensive program and the conferences lasted a whole week. At that conference the basis for the international standards on thrust bearings was laid. Questions relating to tolerances were also thoroughly discussed and even though no final result was obtained at this meeting, the steps taken here were responsible for the later results in Heidelberg, in 1928.

In Paris, a year later (1929), those preliminary decisions were confirmed.

In Copenhagen, in 1931, we arrived at a final decision

on thrust bearings; and a few other things, such as ball bearing housings, were added to the list of items that should be dealt with by the committee.

In Milan, in 1932, the main subject was the question of standardization of taper roller bearings.

In Stockholm, in 1934, we arrived at a solution on plummer blocks, transmission elements, etc.

In Paris, in 1937, a very important meeting was held which was attended by Mr. Hughes (New Departure Company) of this country, among others. We then found a solution for an extra-light series of radial bearings, after years of intensive work and discussions.

Propose General Plan for Dimensions

The last meeting was held in Helsingfors in 1939, only two months before the first Finnish War began. On this occasion the secretariat of Committee ISA 4 presented some new aspects on standardization of anti-friction bearings by submitting a proposal for a general plan for standardization of boundary dimensions. The question of precision tolerances for bearings and certain other related matters were also presented for discussion.

Instead of going into great detail as to everything that happened at those conferences, I should like to give just a few of the reasons and the necessity for all the work done in the past. One might conclude that all these conferences should have given such definite results that nothing more could be gained by still further conferences. In 1934 it was thought that the program of Technical Committee ISA 4 had been completed and that it would be in order to discharge the committee. That this was not done, and that we had to meet again in 1937, was because of the technical development which was taking place in the anti-friction bearing field.

Before the first World War, ball bearings were used mostly in the automotive field and in line shaftings; in those fields were found the major consumers of ball bearings. During the war and also in the 1920's, another large field for using anti-friction bearings was that of electric motors. Furthermore, ball bearings and roller bearings were being used more and more in ordinary machine equipment of all kinds.

Ranges Set in Light, Medium, and Heavy Series

This created the necessity of extending the old ISA standards. It was no longer enough to standardize dimensions up to 210-mm bore, and the result was that the ISA standards agreed upon at the Stockholm meeting in 1927 were for dimensions of radial bearings in the three well-known series, Light, Medium, and Heavy, in the following ranges: up to 320-mm bore, in the Light Series; up to 280-mm bore, in the Medium Series; and up to 240-mm bore in the Heavy Series.

During the 1930's the necessity of further extension became stronger. New fields for anti-friction bearings were being discovered and these could not always be taken care of by the dimensions, or bearing types, already standardized. New bearings had to be created and new dimensions for bearings for lighter sections and heights had to be adopted. This was especially the case in the aircraft field.

Table 1 shows the different kinds of development the anti-friction bearing manufacturers thus had to face and, at the same time, what ranges of diameters standardization engineers had to develop to take care of them.

Table 1

Examples of Ball and Roller Bearing Applications Developed Mostly After the First World War

Kind of Equipment	Predominating Type of Bearing	Approximate Range of Bearing-Bore Diameter (Inches)
Instruments	Ball Bearing	⅛—¾
Fractional-Horsepower Motors	" "	
Household Appliances	" "	
Aviation, Airframe	Ball and Roller	3/16— 4
Aviation, Engine and Propeller	" " "	1—10
Conveying Equipment	" " "	¾— 8
Cranes and Hoists	Roller Bearings	2—40
Traction Motors	Ball and Roller	2— 6
Railroad Journals	Roller Bearings	4½—18
Marine, Deck Machinery	Ball and Roller	1— 6
Auxiliary Machines	" " "	½— 6
Propulsion Machinery	" " "	2—25
Fans and Blowers	" " "	½—15
Pumps	" " "	1—10
Mining Equipment	" " "	1—40
Oil-Field Equipment	" " "	1—12
Machine Tools	" " "	½—20
Machines for the Paper Industry	" " "	½—20
Rolling-Mill Equipment	" " "	2—32
Gear Drives	" " "	1—20

In standardizing ball-bearing dimensions it was necessary, of course, always to ask the opinions of the consumers and obtain their consent. In the old days it was usually the automotive manufacturers who made the decisions as to what they wanted, but as anti-friction bearings became more and more universal for all kinds of industrial activities, it also became necessary to reorganize the procedure in setting standards. In this manner it was done in Germany, Sweden, and other countries. We had to get in touch with manufacturers of steel rolling mills, of tractors, of pumps, of machine tools, etc, in order to arrive at a standard that would satisfy them all. We also found it important to get in touch with everyone who might become a future user of ball bearings, because the development seemed never to stop.

Provides for Future Needs

The thought therefore arose that a standard series of boundary dimensions should be set up—such a standard to take care of all present and future needs. This thought was presented at the Helsingfors meeting.

Accordingly, a general plan of boundary dimensions was developed as a recommendation for international adoption by the national standardizing bodies. In this plan, the dimensions of existing standard series are maintained and a logical layout of dimensions to be used in new designs is presented. Today, there is as yet no need for all of the dimensions contained in this plan, but we know that where the demand for new bearings arises, the requirements can be met by using boundary dimensions given in the international proposal.

ASA—Symbol of Public Acceptance

Democratic Methods in Standards Work Needed in Post-War Industry

Editorial reprinted from "Electrical World," February 5, 1944

AS THE old year was coming to a close the American Standards Association was celebrating its twenty-fifth anniversary. It is a proud record that ASA has hung up in the past quarter century—more than 600 approved American Standards. But better than mere numbers is the fact that ASA has come to be a symbol of public acceptance.

This public confidence was earned because of the methods used in approving a standard. Every group that has a primary interest, including the public and labor, is given ample opportunity to be heard, and no standard is put through until all basic objections have been cleared up. Regardless of how large or influential the sponsoring body is, ASA procedure is democratic.

This is the greatest asset that ASA has. Sometimes it seems as though a standard would never get through, yet it is always better in matters of this kind to take too long than to be too hasty.

In the period after the war the demands for standards will be much greater, principally because of the necessity for elimination of waste in order that more production can be made available for less money. Many old standards will be challenged in the light of war experience. Because of the pressing need of such work there is the probability of public impatience at the slowness of the operation. It might be well, then, to review the procedure and dispense with such red tape as serves no important and useful function, but no step should be eliminated which protects the integrity of the standards or insures the democracy of the system.

During the next quarter of a century we shall find the path of civilization greatly altered economically and socially as the result of the war. One of the possibilities is a greater dependency on standard methods. After the last war many peoples had standards forced on them by government edict. The same economic forces may be at large in this country after the war, but it is hoped that we may continue to make standards of our own choosing—voluntarily and democratically as with ASA.

Field Experience Used In Revised War Standards

Revisions of the American War Standards for electrical panel-type instruments and for external ammeter shunts for panel-type instruments have been completed recently as the result of field experience, and the revised editions have been approved by the ASA as American War Standards. These standards provide complete interchangeability for the instruments both electrically and mechanically, while leaving the manufacturer free to use his ingenuity in design and to introduce improvements. They cover performance requirements, test methods, and dimensions and ranges for a standard series of instruments of the quality demanded by the armed forces.

The revision of the American War Standard for Electrical Indicating Instruments (2½- and 3½-Inch, Round, Flush-Mounting, Panel-Type) results from nearly a year's experience with the standard by the electrical industry and the Armed Forces. A small number of additional ranges has been included in the new edition, and the gun-shock and vibration requirements for the instruments have been made less stringent.

The standard for External Ammeter Shunts for Panel-Type Instruments is a simplification of the ranges of external ammeter shunts which are used to extend the measurement range of electric meters. Careful consideration is given to the inclusion of the so-called switchboard type of shunt in this standard. It was found that in almost all cases where shunts are used with panel-type electrical indicating instruments, the designs shown in the specification would be satisfactory. They are already in extensive production, especially for aircraft use. Shunts of the design recommended in the standard are sufficiently precise for use with panel-type electrical indicating instruments and are, in addition, easier to manufacture and more economical of material than shunts of the switchboard type. Designers of equipment using shunts should utilize this standard as extensively as possible in order that maximum production may be had with a minimum waste of time and material, it is believed. In so far as it is possible, replacement shunts will be based on this standard.

These two standards were prepared through the coordinated efforts of representatives of industry and the armed services, at the request of the War Production Board, in order to facilitate production. Electrical indicating instruments, such as ammeters, voltmeters, and tachometer indicators, are critical components in the war-production program, since they are so universally used in the control and operation of electrical equipment. Both specifications are written so as to be used for procurement purposes by the Army and Navy.

The American War Standard, Electrical Indicating Instruments (2½- and 3½-Inch, Round, Flush-Mounting, Panel-Type) (C39.2-1944) may be obtained for 50 cents a copy and the standard for External Ammeter Shunts (C39.5-1943) for 25 cents a copy. They are available from the government agency concerned, without charge, for procurement purposes only.

BCCC Elects Thompson and Lee

George N. Thompson

Walker S. Lee

George N. Thompson, chief of the Building Codes Section of the Division of Codes and Specifications of the National Bureau of Standards, was elected chairman of the ASA Building Code Correlating Committee at the annual meeting of the committee March 17. Walker S. Lee, president of the Building Officials Conference of America and superintendent of Buildings in Rochester, N. Y., is the new vice-chairman.

Connected with the National Bureau of Standards for the past 20 years, Mr. Thompson has long been active in standardization work. In 1926 he became secretary of the Department of Commerce Building Code Committee and Chief of the Building Codes Section of the Division of Building and Housing in the National Bureau of Standards. In 1934 this section became the Building Codes Section of the Division of Codes and Specifications in that Bureau. He was elected vice-chairman of the Building Code Correlating Committee of the ASA in 1935 and served in that capacity until he became chairman this year. He is chairman of the Sectional Committee on Building Code Requirements for Minimum Design Loads in Buildings (A58), and represents the NBS on a number of other ASA sectional committees. In addition, he is chairman of the subcommittee on Standard Specifications for Fire Tests of Materials and Construction of Committee C5 of the American Society for Testing Materials. He is the author of numerous articles on building code matters. Mr. Thompson succeeds Rudolph P. Miller, chairman of the BCCC since its organization in 1935.

Walker S. Lee, new BCCC vice-chairman, served as Fire Marshal and as Deputy Superintendent of Buildings of the city of Rochester, New York, from 1920 to 1926. For six years he practiced architecture in that city before he was appointed Superintendent of the Bureau of Building, a position he still holds. A member of numerous important committees and technical organizations, he is active in the national standardization work on building codes. Among the committees of the ASA on which Mr. Lee holds membership are: Administrative Requirements for Building Codes (A55); Building Code Requirements for Reinforced Gypsum Concrete (A59); Building Code Requirements for Fire Protection and Fire Resistance (A51); and Specifications for Fire Tests of Building Construction and Materials (A2).

In addition to the chairman and vice-chairman, members of the Executive Committee were elected by the BCCC, as follows:

Clinton T. Bissell, National Board of Fire Underwriters
J. Andre Fouilhoux, American Institute of Architects
R. P. Miller, American Society of Civil Engineeers; American Society for Testing Materials
E. W. Roemeer, member-at-large
Edward Ruehl, American Municipal Association

Bomb Shelters and Prefabrication Considered by ASA Building Committee

THE Building Code Correlating Committee of the American Standards Association at its annual meeting, held March 17 in New York, elected new officers for the year (see above) and considered reports of work already under way as well as proposals for new work.

Reports on the various projects under the committee's supervision indicate substantial progress in the program as a whole. It was announced that two new standards were now available, Building Code Requirements for Masonry, A41.1-1944, and Administrative Requirements for Building Codes, A55.1-1944. A building code ar-

rangement intended to serve as a guide in developing building code requirements was adopted. The arrangement provides a framework for the coordination and effective utilization of completed standards and those in the course of development. The outline, divided into 17 chapters, covers the various divisions of building code requirements from administration, definitions, and classifications to electrical equipment, elevators, and plumbing. The outline is presented for the use of municipal committees and officials in connection with the preparation and revision of local building codes.

Protection Against Air Raids and Prefabrication Suggested as New Projects

New projects proposed dealt with the protection of buildings against air raids, and the development of building code requirements for prefabricated buildings. The first of these, requested by the Office of Civilian Defense, stems from the desire of the OCD that the experience gained and techniques established for protective construction during the war should not be lost. The project involves the evaluation of information now available on protective construction against air raids, the development of principles based on this information, and the indication to designers and officials of the specific application of these principles to new construction. The proposal was discussed by the BCCC and referred to the executive committee for further study and recommendations.

It was also suggested that arrangements be made for the preparation of specific requirements regarding prefabricated construction since building officials may need guidance in passing on proposed prefabricated structures. Reliable test procedures or other criteria to determine the acceptability of prefabricated structures are needed, it was stated. This proposal was also referred to the executive committee.

Miller Retires As BCCC Chairman

Rudolph P. Miller, chairman of the Building Code Correlating Committee since its organization in 1935, retired from the chairmanship at the annual meeting of the committee, March 17. The committee accepted his resignation with regret, but as one member said: "We are grateful that he intends to continue as a member of the BCCC and its Executive Committee and hope that the continuance of his work will go on for many years to come."

Members of the Committee unanimously voted the following resolution of appreciation for Mr. Miller's outstanding service:

WHEREAS, Mr. Rudolph P. Miller, after serving the public for over one-half a century in many official capacities and as a public-spirited citizen interested in the formulation, administering, and enforcing of laws, rules, and regulations pertaining to the construction and maintenance of buildings, has deemed it proper to retire as chairman of the Building Code Correlating Committee of the American Standards Association; and

WHEREAS, Mr. Miller's keen grasp of the principles and fundamentals of standardization in the building code field has been of exceptional value to the Building Code Correlating Committee and its members in preparing and developing a program looking towards the increased uniformity in building code regulations; and

WHEREAS, The work of this committee could not have progressed in the manner that it has were it not for the most excellent leadership and the vast amount of technical knowledge of the retiring chairman; therefore,

It Is Resolved, That while the members of the Building Code Correlating Committee of the American Standards Association deeply regret the decision of Mr. Rudolph P. Miller to retire as chairman of this committee, they take this opportunity to express their grateful appreciation to him for his unfailing courtesy, tact, and helpful guidance in the BCCC for which he has served as chairman since 1935.

Mr. Miller (right) receiving an award for 45 years of distinguished service in the cause of fire prevention, presented by the Greater New York Safety Council in 1941 at ceremonies celebrating the seventy-fifth anniversary of the National Board of Fire Underwriters.

Mr. Miller, who will continue to represent the American Society for Testing Materials and the American Society of Civil Engineers on the BCCC, is an independent consulting engineer. He was for some years Building Commissioner of Manhattan, and chairman of the New York City Board of Standards and Appeals. In this latter capacity, Mr. Miller helped in making decisions concerning requests for exceptions, changes, or revisions in the New York City Building Code. Consultant for a number of municipalities, including Rochester, New York; Stamford, Connecticut; and Cincinnati, Ohio, he has prepared or assisted in the preparation of modern building codes, including those used by the cities of New York, Rochester, and Niagara Falls.

Dimensions for Steep Tapers Added in Revised American Standard

by E. J. Bryant[1]

Chairman, Technical Committee 3, Machine Tapers, of Sectional Committee on Small Tools and Machine Tool Elements

STANDARD dimensions for a series of steep machine tapers have been included in a revised edition of the American Standard for Machine Tapers approved recently by the American Standards Association. The new edition (B5.10-1943) was developed by a sectional committee under the joint sponsorship of the American Society of Mechanical Engineers, the National Machine Tool Builders Association, and the Society of Automotive Engineers, and now includes both the self-holding and the steep taper series.

A machine taper provides a connection between the tool, arbor, or center and its mating part to insure and maintain accurate alignment between the parts and yet permit the parts to be readily separated for reconditioning or for the substitution of other parts. A self-holding taper is one which, because of the small taper angle, stays in place when seated firmly in the socket. The steep taper series, on the other hand, has a taper angle sufficiently large so that a locking device is needed to hold the taper in the socket. When unlocked, these tapers release themselves, and hence are known as self-releasing, or steep, tapers.

Twenty-two Sizes of Self-Holding Tapers

The self-holding taper series consists of 22 sizes, three small sizes taken from the Brown and Sharpe series having a nominal taper of $\frac{1}{2}$ in. per foot; eight sizes taken from the Morse series having a nominal taper of approximately $\frac{5}{8}$ in. per foot; and eleven sizes having a taper of $\frac{3}{4}$ in. per foot. The Morse tapers were adopted after much consideration by the committee because they had been so universally used in this and many foreign countries for twist drill drives. The Brown and Sharpe tapers were selected for the smaller sizes as they were found to be best adapted for this range. The Brown and Sharpe, and Morse tapers used in this series correspond with those used by these companies. The No. 6 and No. 7 Morse tapers were added to this standard to provide for the larger drilling machine applications where these tapers have been generally adopted. The 200 series of $\frac{3}{4}$ in. per foot tapers were worked out on the basis of requirements for the design of heavy machine tools requiring this type of holding device. A table of basic dimensions for the series is included in the standard.

Because the tool to which the taper provides a connection must in most cases be placed in motion, the method of transmitting the motion from the spindle to the tool is important in the design of the self-holding tapers. This can be done either by friction or by a positive drive. The positive drive is preferable and may be obtained by providing either a tongue on the shank and a slot in the socket, or by keyways in both shank and socket with radial keys to transmit the torque. With the larger sizes of tapers the external forces resulting from this motion, which tend to force the taper from the socket, are so strong that although the self-holding feature is still present, it is often necessary to provide a more positive means of locking the shank in place. Drive keyways and draw bolts are used for this purpose.

The importance of this problem has been recognized in the new standard, and tables are included giving detail dimensions and tolerances for self-holding taper shanks and sockets classified as to the means of transmitting the torque from the spindle to the shank of the tool, and also as to the means of retaining the shank in the socket.

Tables are also given for the dimensions and tolerances for the plug and ring gages applying to these tapers.

Dimensions Added

Dimensions for the steep machine tapers, developed by milling machine manufacturers and adopted by the National Machine Tool Builders Association, which have been added in the standard in this edition for the first time, include the taper per foot, diameter of gage line, and length along axis.

Twelve sizes are given, six in the "Preferred Series," indicated by bold-face type; and six in the "Intermediate Series," indicated in light-face type.

The American Standard for Machine Tapers, Self-Holding and Steep Taper Series (B5.10-1943) is one of a series of standards being developed by the ASA Sectional Committee on Small Tools and Machine Tool Elements (B5), under the sponsorship of the American Society of Mechanical Engineers, Society of Automotive Engineers, and National Machine Tool Builders Association. W. C. Mueller, Western Electric Company, is chairman of the sectional committee.

Copies of the standard are available from the American Standards Association at 60 cents each. Members of the ASA are entitled to 20 percent discount on all approved American Standards.

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[1] Chief Engineer, Gage Division, Greenfield Tap and Die Corporation, Greenfield, Mass.

Revised Standard on Tool Shanks Lists Preferred Sizes

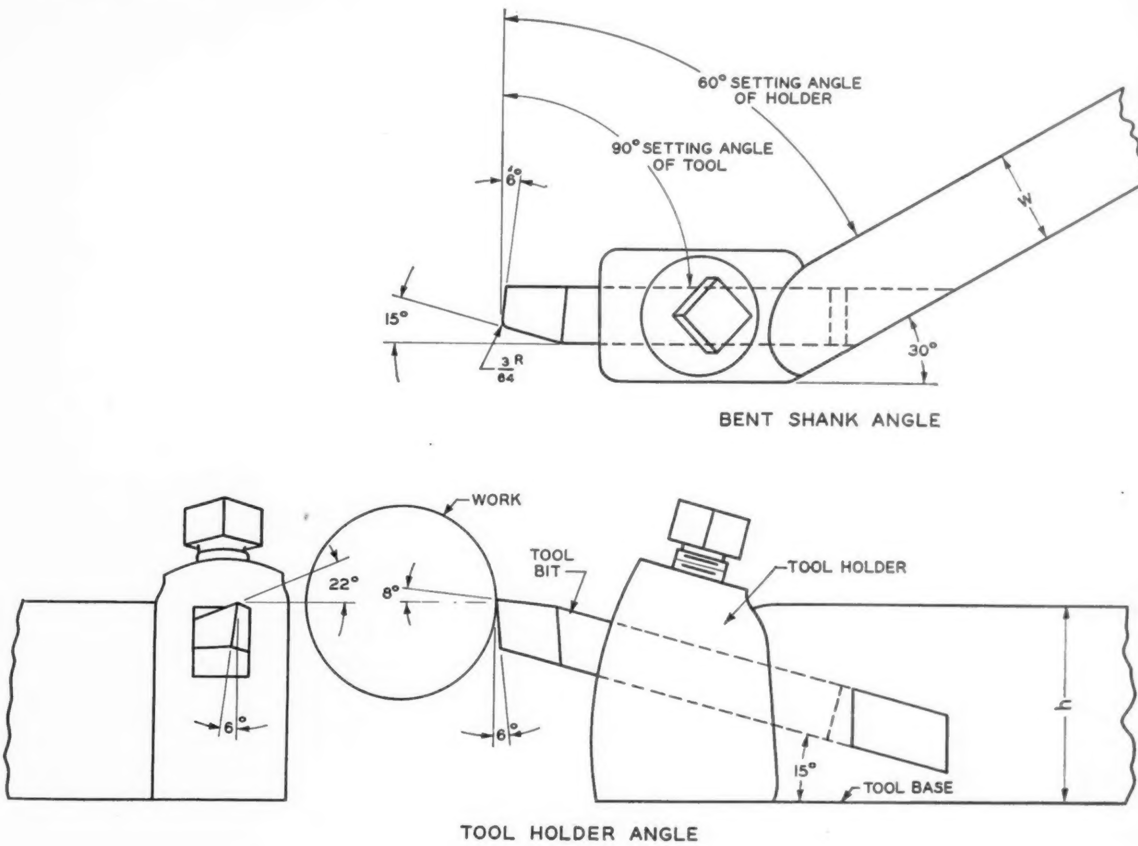
by O. W. Boston[1]

Chairman, Technical Committee 2 ASA Sectional Committee on Small Tools and Machine Tool Elements

A REVISION of the American Standard for Tool Shanks and Tool Posts for Lathes, Planers, Shapers, Boring Mills, and Turret Lathes (B5.2-1943) recently received final approval by the American Standards Association. The revised standard, which has been developed under the sponsorship of the Society of Automotive Engineers, the National Machine Tool Builders Association, and the American Society of Mechanical Engineers, presents a list of preferred sizes for square and rectangular tool bits, tool shanks, and tool holders. In addition, it concludes a section on nomenclature applicable to various types of tool posts used on lathes, turret lathes, boring mills, planers, and shapers.

The first edition of the American Standard for Tool Holder Shanks and Tool Post Openings was completed in 1929 under the chairmanship of Paul M. Mueller. Its single table gave the shank section (width and height) of tool-holder openings for lathes, planers, and shapers, and the lathe-center heights for a variety of sizes of tool shanks.

[1] Director, Department of Metal Processing, University of Michigan, Ann Arbor, Mich.



Tool Nomenclature

Back Rake	8 deg	Side Relief	6 deg
Side Rake	22 "	End Cutting Edge	6 "
End Relief	6 "	Side Cutting Edge	15 "
		Nose Radius	3/64 in.

Fig. 1. A typical tool holder with 30-deg left bent shank and 15-deg tool holder angle. A right-cut tool bit ⅜ in. square of high-speed steel, for turning soft steel, is shown.

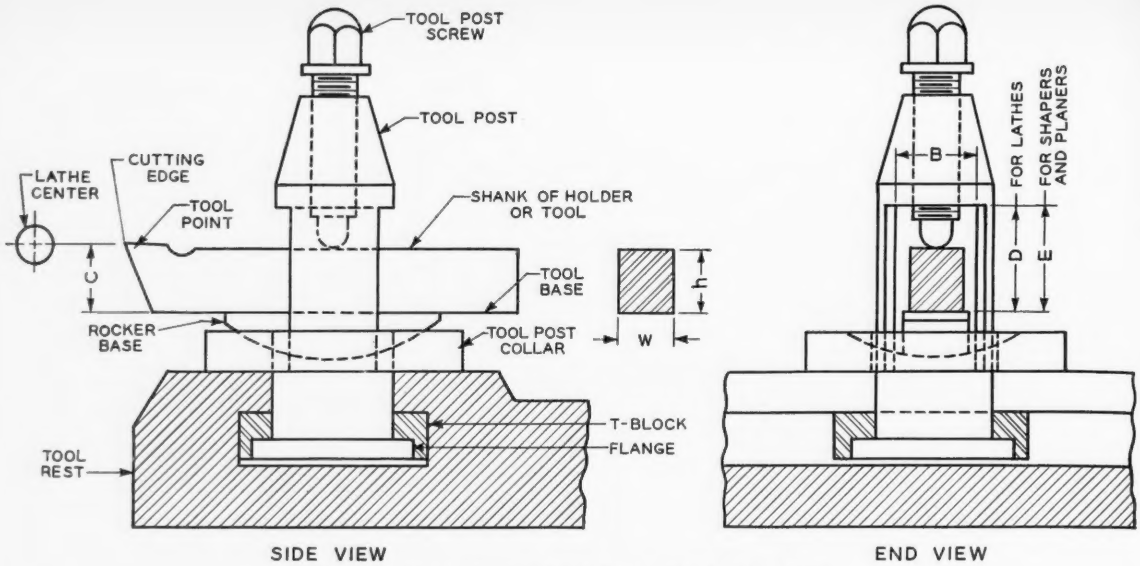


Fig. 2. Single-Screw Tool Post with Rocker Base.

In 1935, a revision of this standard was started when technical committee 2 on Standardization of Tool Shanks and Tool Posts was organized, with O. W. Boston as chairman, under the ASA Sectional Committee on the Standardization of Small Tools and Machine Tool Elements. The first work of this technical committee was to develop the nomenclature for several types of tool posts. After standard nomenclature was agreed upon, extensive surveys were made to list current sizes of tool bits and shanks of high-speed steel, cast non-ferrous metals, and sintered-carbide-tipped tools. This table grew to be quite extensive in the course of development, as tools were being made in many different sizes by the various manufacturers. The length of the bits and tools was particularly variable. In view of this fact, the committee finally agreed that the number of sizes should be reduced to a minimum, and that the standard dimensions should cover the width, height, and length of the tool.

Table 1. Length of Flat, of Square Tools for the Sections Indicated

Cross Section[1] Square	Length, *l* Solid Tools (S)[2]	Length, *l* Tipped Tools (T)[3]
3/16	2	...
1/4	2 1/2	2 1/4
5/16	2 1/2	2 1/4
3/8	3	2 1/2
1/2	4	3 1/2
5/8	4 1/2	4
3/4	6	4 1/2
1	7	7
1 1/4	8	7
1 1/2	10	9

All dimensions are given in inches.
[1] All other lengths for standard square tools are considered special.
[2] Solid tools include such tools where the full section cutting end only of the full shank section consists of metal-cutting material.
[3] Tipped tools are those where a relatively small piece of metal-cutting material is attached to the tool shank.

In addition, the tools were reclassified according to whether they were solid or tipped tools, disregarding the specific material of which they were made. *Solid tools* were defined as those having the full section of the cutting end (or point) consisting of the metal-cutting material. *Tipped tools* are those having a relatively small piece of metal-cutting material attached to the tool shank to form the tool face and cutting edge.

A tool holder with a perishable tool bit of cutting-tool material is shown with current American Standard nomenclature in Figure 1; while Figure 2 shows a solid tool held in a single-screw tool post as used on most small engine lathes, and the names of the principal elements. A tool holder with a fixed serrated tool base plate as used on planes (or heavy-duty lathes) is shown with its nomenclature in Figure 3.

The sizes of the bits or solid tools are given in Tables 1 and 2. Table 1 shows those of square section, whether of carbon steel, high-speed steel, cast non-ferrous metal, or structural steel shanks tipped with these metals or with sintered carbide.

Table 2. Length of Flat, of Rectangular Tools for the Sections Indicated

Cross Section	Length, *l* Solid Tools (S)[1]	Length, *l* Tipped Tools (T)[1]
1/4 × 1/2	4	...
5/16 × 5/8	4 1/2	...
3/8 × 3/4	5	...
1/2 × 3/4	5 1/4	5 1/4
1/2 × 1	*5 1/2 or 7	*5 1/2 or 7
5/8 × 1 1/4	*6 1/2 or 8	*6 1/2 or 8
3/4 × 1 1/2	*6 1/2 or 9	*6 1/2 or 9
1 × 1 1/2	10	10
1 × 2	12	12
1 1/2 × 2	...	*9 or 14

All dimensions are given in inches.
[1] Definitions of solid and tipped tools are given in the standard.
* Shorter lengths normally for turret lathes, boring mills, etc.

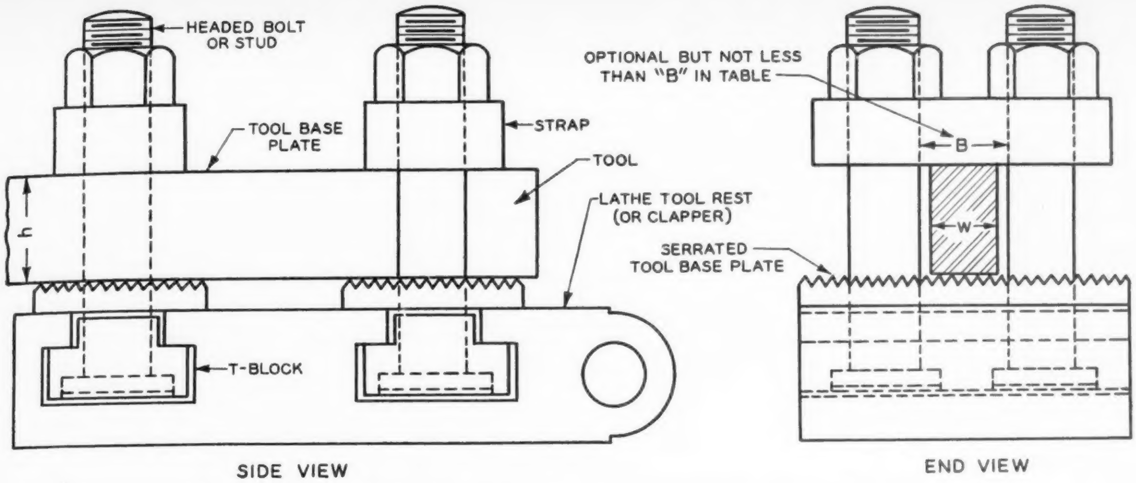


Fig. 3. Strap and Stud Clamp Type of Tool Holder with Serrated Base.

The tipped tools are slightly shorter than the solid tools when new, as they may be shortened by grinding only a portion of the length of the tip before the tool is scrapped. The solid tools, on the other hand, may be ground shorter until they can no longer be held by the tool holder.

Percentage of Square Size Shipped

A manufacturer of sintered carbide tools showed that in 1939, of 39,298 tools shipped, percentages of each square size were as follows:

3.4	percent	for the	¼	inch	square
9.4	"		5/16	"	"
28.0	"		⅜	"	"
22.8	"		½	"	"
12.4	"		⅝	"	"
8.0	"		¾	"	"
1.3	"		1	"	"
1.8	"		1¼	"	"

For the rectangular tools the percentages were:

3.3	percent	for the	½ x 1	inch	shank
6.0	"		⅝ x 1¼	"	"
1.8	"		¾ x 1½	"	"
1.8	"		1 x 1¼	"	"

The committee felt that these indicated the trend of tool usage in general. There was a great variation in sizes of large tools, i.e., those above one-inch square, most of which are made by the user, and it was considered unwise to attempt to include these in the standard.

It was also found that the sectional size of tool holders was higher in proportion to a given width of shank than that of solid or tipped tools. A separate table, number 3, was therefore added so that tool designers, machine tool designers, and the shops would have these sizes available for ready reference. Two large manufacturers of tool holders were in common agreement on all sizes, from small to very large, for each of several purposes, so their standards, as given in Table 3, were made part of the standard.

Table 3. Size of Shank for Various Types of Tool Holders

Turning Tools w × h × l	Cut-Off and Side-Cutting Tools w × h × l	Boring Tools w × h	Threading Tools w × h × l	Knurling Tools w × h × l	Carbide Tipped Tool Holder w × h × l	Planer Tools w × h × l
5/16 × ½ × 4	....	....	....	....	....	....
5/16 × ¾ × 4½	5/16 × ¾ × 4½	5/16 × ¾	5/16 × ¾ × 5	5/16 × ¾ × 5	....	....
5/16 × ⅞ × 5	⅜ × ⅞ × 5	⅜ × ⅞	⅜ × ⅞ × 5	*⅜ × ⅞ × 5	⅜ × 15/16 × 6	....
½ × 1⅛ × 5	½ × 1⅛ × 6	½ × 1⅛	½ × 1⅛ × 6	*½ × 1⅛ × 6	½ × 1¼ × 7	½ × 1 × 6
⅝ × 1⅜ × 7	⅝ × 1⅜ × 7	⅝ × 1⅜	⅝ × 1⅜ × 7	*⅝ × 1⅜ × 7	⅝ × 1½ × 8	⅝ × 1¼ × 8½
¾ × 1⅝ × 8	¾ × 1⅝ × 8	¾ × 1⅝	....	....	¾ × 1¾ × 9	¾ × 1½ × 10
⅞ × 1¾ × 9	⅞ × 1¾ × 9	⅞ × 1¾	....	⅞ × 1¾ × 9	⅞ × 1⅞ × 10	....
1 × 2 × 11	....	1 × 2	....	....	1 × 2⅛ × 12	1⅛ × 1¾ × 13
1¼ × 2¼ × 13	....	....	....	....	....	....
....	....	....	....	....	....	1⅜ × 2 × 16
....	....	....	....	....	....	1⅞ × 2¼ × 19
....	....	....	....	....	....	2⅛ × 2¾ × 22

All dimensions are given in inches.
* Tolerance of +½ in. may apply.

Industrial Commission Asks Data On Labels for Toxic Materials

An investigation of the present methods of labeling toxic materials used in industry is now being carried on by the Industrial Accident Commission of California, which believes that it may be necessary to issue a safety order forbidding the use of such materials unless an adequate warning label is attached. Before issuing such an order the Commission is asking for information from industry as to its experience with the present methods of labeling.

A discussion of the Commission's investigation and the reasons for it was published recently in the *California Safety News*, and is reproduced in part below. Readers of INDUSTRIAL STANDARDIZATION who may have had experiences similar to those described, or who are otherwise interested in the question, are invited to send comments to the Industrial Accident Commission of California, State Building, San Francisco 2, California. The *News* reports:

"The substances under consideration include carbon tetrachloride, trichlorethylene, benzol (benzene), toluol (toluene), carbon disulphide, many organic solvents, and others. These substances, alone or mixed with others, are sold under many trade names, often with no indication of their dangerous properties. Carbon tetrachloride, for example, has been sold as Asordin, Carbona, Chlorasol (25 percent carbon tetrachloride, 75 percent ethylene dichloride) Katarine, Phoenipine, Pyrene, Spectral, Tetra, Tetracol, Tetraform and, no doubt, under a number of other names. Trichlorethylene has at least as many aliases. Paint thinners sold as 'Petroleum Naphtha,' a relatively harmless substance, have been reported to contain up to 30 percent benzol and toluol.

No Restriction on Sale or Use

"The sale of some poisons and most drugs is regulated by State and Federal laws but there are many other harmful substances whose sale and use is not restricted. Many of them are useful or even essential to industry and safe methods of handling them can always be worked out; but if they are unlabeled or mislabeled, they can be a source of serious danger to many workmen.

"The United States Public Health Service is solving the problem, to a certain extent, through agreements with the manufacturers of certain substances. The manufacturers have agreed to label their products with appropriate warnings and to require jobbers and distributors to do the same if the material is repackaged. The most recent of these agreements deals with chlorinated naphthalenes, chlorinated diphenyls, and chlorinated diphenyl oxides. These substances are either solids or liquids, and are used in the electrical industry as transformer oils, sealing compounds for small condensers, and for impregnating the insulation on wires in flame-resistant cables.

"Similar agreements exist between the United States Health Service and the manufacturers of aniline oil, of benzol, of carbon tetrachloride and similar volatile chlorinated hydrocarbons, of carbon bisulphide, and of wood alcohol, though the agreements covering benzol, aniline oil, and carbon bisulfide are limited to the labeling of these substances when sold for domestic consumption. However, the California Bureau of Industrial Health recently found concentrations of carbon tetrachloride ranging from 200 to 500 parts per million in the air of a plant using a cleaning fluid labeled nontoxic and noninflammable. The maximum permissible concentration of carbon tetrachloride is given in the Dust, Fumes, Vapors, and Gases Safety Orders as 100 parts per million. It was also found that the cleaning fluid is flammable.

Mixed Materials May Prove Dangerous

"Another danger exists where mixed materials are used. For instance, carbon tetrachloride is often added to flammable, nontoxic solvents such as benzine or petroleum spirits to make them less flammable. On exposure to the air, both substances begin to evaporate. If the flammable, nontoxic material evaporates the faster of the two, the mixture becomes richer and richer in carbon tetrachloride, and more and more toxic. If the carbon tetrachloride evaporates the faster, the mixture becomes more and more flammable. In either case, after a few days, the substance may be totally different from what it was originally, and men using it may be exposed to a danger of which they have no knowledge.

"Complete labeling of dangerous substances would make an appraisal of the hazards of a process much easier and more sure than it is now. Parting compounds used in foundries are an example of what can be done to remove hazards. At one time, parting compounds with a high silica content were common, and the men using them ran a risk of contracting silicosis. For some years, the Industrial Accident Commission has forbidden the use of any parting compound containing more than 1 percent free silica. Each such compound must be analyzed by a reputable, independent laboratory or chemist, and a sworn copy of the analysis is filed with the Commission. If the analysis indicates that the composition of the substance is satisfactory, the Commission issues an approval for the compound and it may be used in any place of employment in the State. Since the procedure has been followed, parting compounds have ceased to be a problem.

Little Data on Toxicity

"Toxic materials in general present, of course, a far greater problem than the parting compounds did. There are thousands of chemicals in use in industry, and for many of them, especially those recently developed, there are no data available on toxicity, or only data so general and vague as to be of little value. Better information will surely be forthcoming on some of the substances, but there will also be new substances coming

into use. It is probable that only a very small fraction of the total number of substances in use can be considered in the proposed order, especially at first. In choosing the substances, an effort will be made to include the most hazardous substances and to include the substances which may affect the greatest number of men. Later, the original list can be added to, as need arises or more knowledge of hazards is gained."

New Foreign Standards Now in ASA Library

THE following new and revised standards, just received by the American Standards Association from other countries, may be borrowed by ASA Members, or ordered through the ASA Library. The standards are published in the language of the country in which they were issued.

Great Britain

A-C and D-C Motors and Generators, excluding shipborne and airborne machines BS1156:1944
Cold Twisted Steel Bars for Concrete Reinforcement BS1144-1943
Concrete Railway Sleepers BS986:1944
Enamelled Copper Wire BS156:1943
Engineering Drawing Office Practice BS308:1943
Filtered Sperm Oil BS997:Part 2:1943
Gas Welding of Aluminium and Certain Aluminium Alloys BS1126:1943
High Speed Steel Butt-Welded Blanks for Shanked Type Cutting Tools BS1119:1943
Lacquers for the Internal Coating of Thermally Processed Food Cans, Testing of BS1149:1944
Open-ended Carbon Steel Spanners, BSW and BSF BS192:1943
Rolled Asphalt BS1152:1944
Solid Drawn Steel Air Receivers BS430:1944
Special Salt-Glazed Ware Pipes with Chemically Resistant Properties BS1143:1944

Great Britain—(Continued)

Storage of Micro-Film, Recommendations for the BS1153:1944
Tubular Steel Scaffolding BS1139:1943
Use of Cathode Ray Tubes in Equipment BS1147:1943

Draft Standards

De-oxidised and Arsenical Coppers CG(NF)5461
Milled Lead Sheet and Strip for Building Purposes CG(NF) 5685
Spectrographic Analysis of Zinc Alloys for Die Casting CG (NF)5585
Spectrographic Determination of Aluminium and Magnesium Alloys covered by BS1004 CG(NF)5367

New Zealand

Lubricating Cup Greases of the Lime Base Type NZSS E.144
Vegetables, Standard Specifications for NZSS E.127

Switzerland

Dilution des huiles, constituants volatils des huiles usagees 81116 S.1 & 2 P Fr-.60
Examen du soufre corrosif 81117 S.1 & 2 P Fr-.60
Indications sur l'emploi rationnel des huiles emulsibles pour l'usinage des metaux 81143.S.1-3P Fr-.90
Residu de vaporisation 81114 S.1-4P Fr-.90
Teneur en soufre (soufre total) 81118 S.1 & 2P Fr-.60
Valeur indetonante 81115 S.1-4P Fr.1.20

Munsell Foundation To Promote Color Standardization

The scientific advancement of knowledge to color standardization, nomenclature, and specification is one of the primary objects of the Munsell Color Foundation, Inc. which was organized recently. The Foundation will also encourage the application of this scientific knowledge to color problems arising in science, art, and industry.

The Foundation is a non-profit organization, which will have a Board of Trustees, one of whom is to be a member of the staff of the National Bureau of Standards; one is to be appointed by the Executive Committee of the Inter-Society Color Council; one by the manager of the Munsell Color Company; one is to be the representative of the Munsell family; and three will be trustees at large.

Deane B. Judd is the first trustee of the new Foundation to be appointed by the Director of the National Bureau of Standards; and Loyd A. Jones, nominated by the Optical Society of America, is one of the trustees at large. Both Dr. Judd and Mr. Jones are active in technical committees working on American Standards under the procedure of the American Standards Association.

The American War Standard on Specification and Description of Color, approved by the American Standards Association in 1942, recognizes the Munsell Book of Color as the only system of material color standards calibrated in terms of the basic specification—the percentage of light reflected or transmitted by the color, as determined by the spectrophotometer. The Inter-Society Color Council–National Bureau of Standards system of color names is also based on the Munsell system.

U. S. Societies Present Standards to Latin America

The Inter-American Department of the American Standards Association announces that several organizations in the United States have presented copies of their standards to the national standardizing bodies in Latin America. The Technical Society of the Pulp and Paper Industry has sent a full set of its standards to Argentina for presentation to IRAM, the Argentine standardizing body. The American Society for Testing Materials has forwarded two sets of its 1942 Book of Standards and its 1944 Supplement to Brazil, one for use by ABNT, the Brazilian standardizing body, and one for M. E. Souza, ASA Field Representative.

Cyrus T. Brady, Jr., General Field Representative of the American Standards Association in Latin America, has returned to Buenos Aires. While in the United States he spoke on the general question of electrical standardization in Latin America before the Codes and Standards Committee of the National Electrical Manufacturers Association, and on Latin-American standardization before the Joint Committee on Latin-American Standards of the Valve Manufacturers Association.

Medical Association Adopts Metric System

THE American Medical Association announces that in future editions of its publications it will standardize on the use of the metric or centimeter-gram-second system in giving quantities and dosages. This step, the announcement declares, is in harmony with the growing and current practice of prescribing vitamins, hormones, and sulfonamide preparations. The publications involved will include *New and Nonofficial Remedies; Useful Drugs;* the *Epitome of the U. S. Pharmacopeia and National Formulary;* and *Internes' Manual.* The necessary conversion tables will be printed in each volume.

"The traditional system of measures and weights (later codified as the imperial or foot-pound-second system) and the centimeter-gram-second systems afford an entertaining contrast," declares the Council on Pharmacy and Chemistry of the American Medical Association in announcing the new policy (*Journal* of the American Medical Association, December 4, 1943). "Each system is based on units of length, mass, and time. The traditional measures are ancient in origin and historically have been derived from anatomic structures or articles of common use. The foot was originally the length of any one's foot, regardless of size and style of shoe. This very variable measure prevailed until Edward II (A.D. 1324) decreed that 'three barley corns, round and dry, shall make an inch, twelve inches a foot, three feet a yard.' In recognition of the need for uniformity, it was decreed that the barley corns must be taken from the center of the ear and placed end to end.

"Other units of length were the cubit, or the length of the forearm; this was used in ancient Egyptian, Hebrew, and Roman mensuration; the yard, which Henry I is said to have decreed should equal the distance from the point of the kingly nose to the end of the regal thumb; the rod, which was defined as the 'combined length of the left feet of sixteen men when lined up "heel to toe" as they left church on a Sunday morning.' . . . .

"The origins of the metric system, in contrast to the traditional or natural system, are relatively modern and completely rational. The plan on which the decimal system of interrelated measures and weights is based was devised in 1783 by the English engineer James Watt, who is declared to have thought this his greatest invention. Watt conferred with Laplace and other eminent French scientists in Paris in 1786. The actual units of the metric system were established by a committee of the French Academy of Sciences acting for the French government. The metric standards were officially adopted in France in 1799.

"The fundamental unit of the metric system is the unit of length or meter; the unit of volume or liter is a cube of 1/10 meter side; the gram, or unit of weight, is 1/1,000 the weight of a liter of water at 4 C, its temperature of greatest density.

"From the meter and gram are derived, by merely moving the decimal place, the scientific measures of length required from geographic distances to the units of cytology (μ, microns) and those used in the measurements of atomic spacking and radiation (angstrom units) and all metric units of mass and volume. The scientific units of velocity, acceleration, force, energy, work, and power are simply and logically derived from the fundamental metric units, as indeed the complex units of all the pure and applied sciences may, with the aid of certain conversion constants, be derived step by step without break in logic.

"The metric system was in 1937 obligatory in Argentina, Austria, Hungary, Belgium, Brazil, Chile, France, Germany, Greece, Italy, Mexico, Netherlands, Norway, Peru, Portugal, Rumania, Spain, Sweden, Switzerland, and Yugoslavia. Its use is legalized in Egypt, Britain, Japan, Russia, Turkey, and the United States. In 1875 there was constituted at Paris the International Bureau of Weights and Measures, which is managed by an international committee. The object of the bureau is to make and provide prototypes of the meter and kilogram for the various subscribing countries."

NEMA Standardization Activities[1]

by Frank Thornton, Jr.[2]

Chairman, Standards Committee, National Electrical Manufacturers Association

THERE is more standardization activity in the electrical industry than in most other industries. Several influences contribute to the need for such standardization. In the first place, much of the product must function in conjunction with that of other manufacturers in the industry because they may be all connected to one system of electrical conductors. Secondly, the products probably are used in more different kinds of human activities than those of any other industry. In addition, electrical manufacturers probably use more different kinds of raw materials than any other manufacturing group.

Special Problem

Electrical apparatus is subject to one problem not encountered in connection with most other equipment. While it is true that an automobile tire must be made to such dimensions that it will fit on the rims of numerous automobiles, yet it will run on almost any kind of a road. Most electrical apparatus must be designed to operate in parallel, or in series with other electrical apparatus connected to the same system of wires. Generators made by several different companies installed in several different power houses must run in parallel, feeding power into the same network of a transmission system. This means that all of them must produce alternating current of practically identical wave shape and voltage to avoid interchange of power among the different machines. Farther along this transmission system are protective devices, transformers, and the entire range of utilization equipment, all of which must operate successfully as one system. NEMA standards constitute a definite contribution toward this objective.

Joint activity between electrical manufacturers and electrical power producers, such as the EEI-NEMA Joint Committee on Coordination of Insulation, is very important in the electrical industry. Likewise it is often important to coordinate between the electrical power industry and such other industries as the communication industry. An example is the problem of interference between electrical apparatus and the telephone and radio systems, for which there is a Joint Committee of all the various interests on the Acoustic Relations of Power and Communications Apparatus and Systems. Another example of a joint activity among various interests in the electrical field is the Industry Committee on Interior Wiring Design on which there are representatives of manufacturers, utilities, wholesalers, inspectors, architects, etc.

In the field of safety the electrical manufacturer must be constantly active. Electricity, properly controlled, is a dutiful servant. Improperly controlled it can be a terrible hazard. It is a tribute to the electrical industry that it has been able to enjoy such a tremendous growth in the past fifty years with such a low fire and accident record. This does not mean that the electrical manufacturer can relax, because new problems are constantly arising. Provision for work in this field is made through committees which have developed and which keep up to date such codes as the National Electrical Safety Code, the National Electrical Code, and the whole series of safety codes for various industries being developed under the procedure of the ASA.

Standards for Parts

Standards for parts such as bolts, screws, washers, and many other mechanical devices are of great importance to the electrical industry because of the large quantity and wide variety used by it. Here again it is necessary to cooperate closely with those developing such standards through the medium of the American

[1] Reprinted from *NEMA News*, Vol 10, No. 24, December 30, 1943.

[2] Mr. Thornton is Engineering Manager, Westinghouse Electric and Manufacturing Company. He is representative of NEMA on the Standards Council of the American Standards Association.

Society of Mechanical Engineers, the American Standards Association, and others. For example, the ASA Sectional Committee on Standardization of Gears has been active in the development of standard tolerances on shaft extension diameters and keyways and also on standard keyways for holes in gears, both of which are of interest to motor and generator manufacturers. Any activity of the ASA Sectional Committee on Standards and Unification of Screw Threads is certainly of vital interest to every electrical manufacturer.

Standards for Materials

Standards and specifications for raw and semi-finished materials have been under development for many years by such organizations as the American Society for Testing Materials, the Society of Automotive Engineers, and other organizations. Although electrical manufacturers naturally are interested in the physical and chemical characteristics of materials they are especially interested in those other characteristics not usually of concern to most industries. For instance, we are vitally concerned about the behavior of magnetic materials, electrical conductivity of conductors, electrical resistance and dielectric loss of insulators, and many other characteristics in which other industries have little interest. It is therefore important that we pay close attention to the standards and specifications for materials being developed by other organizations and in many cases guide those applying to material of especial significance to the electrical industry.

Benefits to User

Because electrical apparatus is used in so many different industries as well as in homes and commercial establishments, numerous features are important subjects of standardization because of the benefits whch accrue to the user resulting from uniformity in products made by different manufacturers. Probably the most important function of standardization is to provide a means for clearly defining a product. Every standard should include the necessary definition of terms, method of test, and such values of test results as will be needed to describe definitely an individual article. The establishment of definitions and determination of proper methods of test is an engineering problem which in our industry is solved, usually, through the medium of discussions of standardization in the American Institute of Electrical Engineers. The establishment of ratings, performance, dimensions, tolerances, etc, for a line of standard sizes of commercial products is largely the work of the National Electrical Manufacturers Association. American Standards of this character are usually finally developed under the procedure of the ASA, in the committees of which producer and consumer have equal rights. In general no specification or standard can be considered useful unless it is accepted by both the producer and consumer, because consumers are always free to write their own specifications if they so desire. One benefit of the standardization procedure is to bring about unification of consumer requirements so as to avoid a multiplicity of differing specifications among many consumers.

NEMA Members Participate in Work

All this activity means work on the part of a great many NEMA members who participate in the work of the various committees dealing with these problems. It is difficult to present a statistical picture in the space available here but perhaps some idea can be gained from the actions of the Codes and Standards Committee which correlates the activities of NEMA in this field. During the year 1943 this committee of 19 members held seven meetings which involved consideration and action on a total of 400 problems that had come up through the usual procedures. This means an average of 57 such actions at each meeting. Although all of the documents considered by that committee were not included in the minutes it required an average of 24 single-spaced typewritten pages on which to report the actions at each of these meetings. To show the attention which the members of this committee give to these problems, the average attendance at the meetings was 71 percent.

It has been a pleasure to serve as chairman of this industrious committee and I am sure that its members will continue to give equally diligent attention to all of the problems during the coming year.

ASA Approves Four ASTM Wire Standards

Four standards for zinc-coated products developed by the American Society for Testing Materials were approved as American Standards in January. These standards were recommended to ASA for approval by the Sectional Committee on Zinc Coating of Iron and Steel (G8) which found that they had received the required degree of national acceptance to warrant approval as American Standard. The standards, with their ASA and ASTM designations, are:

Zinc-Coated (Galvanized) Iron or Steel Telephone and Telegraph Line Wire, Specifications for ASA G8.3-1944; ASTM A111-43

Zinc-Coated (Galvanized) Iron or Steel Farm-Field and Railroad Right-of-Way Wire Fencing, Specifications for ASA G8.9-1944; ASTM A116-39

Zinc-Coated (Galvanized) Iron or Steel Barbed Wire, Specifications for ASA G8.10-1944; ASTM A121-39

Zinc-Coated Steel Wire Strand (Class B and Class C Coatings), Specifications for ASA G8.11-1944; ASTM A218-41

Of these standards, the first three are the latest editions of well-known ASTM standards that have been revised a number of times to keep them current with technologic developments.

The fourth is a comparatively new standard for which tentative specifications were first prepared in 1939 by ASTM Committee A-5 on Corrosion of Iron and Steel. The strand specifications provide for heavier zinc coatings than are called for in Specifications for Zinc Coated Steel Wire Strand, "Galvanized" and Class A ("Extra Galvanized") ASA G8.6-1943; ASTM A122-41.

Copies are available from the American Standards Association, 29 W. 39th Street, New York 18, N. Y., or from the American Society for Testing Materials, 260 South Broad Street, Philadelphia 2, Pa., for 25 cents.

Standards Issued by Associations and Government

(See "ASA Standards Activities", page 81, for new American Standards and progress on ASA projects)

For the information of ASA Members, the American Standards Association gives here a list of standards received by the ASA Library during the past month. The list given below includes only those standards which the ASA believes are of greatest interest to Members in connection with their war production problems.

These standards may be consulted by ASA Members at the ASA Library, or copies may be obtained from the organization issuing the standard. The address of the organization is given for your convenience.

Associations and Technical Societies

American Society for Testing Materials (260 South Broad Street, Philadelphia 2, Pa.)

The letter T following a designation indicates the standard is Tentative. Where an additional number appears within parentheses, it indicates there is an Emergency Alternate Provision attached to the standard.

Asphalt Composition Battery Containers, Tentative Methods of Testing D 639-43T
Calibrating a Light Source Used for Accelerating the Deterioration of Rubber, Tentative Method of C 749-43T
Carbon-Steel Seamless Drum Forgings, Tentative Specifications for A 266-43T
Chemical Analysis of Rubber Products, Tentative Methods of D 297-43T
Chloroprene Sheath Compound for Electrical Insulated Cords and Cables, Tentative Specifications for D 752-43T
Chloroprene Sheath Compound for Electrical Insulated Cords and Cables Where Extreme Abrasion Resistance Is Not Required, Tentative Specifications for D 753-43T
Compressive Strength of Plastics, Tentative Method of Test for D 695-44T
Insulated Wire and Cable
- Heat-Resisting Synthetic Rubber Compound, Tentative Specifications for D 754-43T
- Performance Synthetic Rubber Compound, Tentative Specifications for D 755-43T

Polystyrene Molding Compounds, Tentative Specifications for D 703-44T
Resistance to Accelerated Light Aging of Rubber Compounds, Tentative Method of Test for D 750-43T
Rubber-Coated Fabrics, Tentative Methods of Testing D 751-43T
Vinylidene Chloride Molding Compounds, Tentative Specifications for D 729-44T
Electrical Insulating Materials, ASTM Standards on February 1944 $2.75
Rubber Products, ASTM Standards on February 1944 $1.75

National Electrical Manufacturers Association (155 East 44th Street, New York 17, N. Y.)

Single-Stage and Multi-Stage Mechanical Drive Steam Turbines, Recommended Standards for Publication No. 43-88 December 1943 50¢
Vulcanized Fibre Standards Publication No. 43-87 December 1943 25¢

Society of Automotive Engineers (29 West 39th Street, New York 18, N. Y.)

(Revisions are marked with "A" or "B" following the specification number. Complete set in loose leaf form for 80¢.)

Aluminum Alloy, Magnesium Silicon Copper (61ST) Extruded AMS 4150
Aluminum Alloy Tubing, Magnesium Chromium (52S-O) AMS 4070B
Aluminum Alloy Tubing, Magnesium, Silicon, Copper (61S-O) AMS 4080B
Bearings, Silver, Steel Back AMS 4815A
Brass Rods and Bars, Free Cutting, Half Hard AMS 4610B
Cloth, Lightweight Airplane, Cotton, Mercerized AMS 3802
Corrugated Fibreboard (Single Wall, Double Face) AMS 3552
Fibre, Vulcanized AMS 3564
Paper, Greaseproof Wrapper, Laminated AMS 3542
Rivets, Aluminum (2S-½H) AMS 7220A
Rivets, Aluminum Alloy (A17S-T) AMS 7222A
Steel, Corrosion Resistant, 13 Chromium (Free Machining) AMS 5610B
Steel, Sheet and Strip, Extra Deep Drawing (Special Quality) Low Carbon AMS 5041
Steel, Sheet and Strip, Forming (Special Quality) Low Carbon AMS 5043
Steel Wire Screen, Corrosion Resistant, 18 Chromium—8 Nickel —2 Molybdenum AMS 5690B
Synthetic Rubber, Hot Oil Resistant, High Swell (45-55) AMS 3222A
Synthetic Rubber, Rapid Fuel Swelling (45-55) AMS 3221A

U. S. Government

(Wherever a price is indicated, the publication may be secured from the Superintendent of Documents, Government Printing Office, Washington, D. C. In other cases, copies may be obtained from the government agency concerned.)

National Bureau of Standards (Washington, D. C.)

Air Compressors for Automotive Service Stations and Garages (Motor-driven, ½ to 10 horsepower) R202-43 5¢
Effect of Humidity on Physical Properties of Paper C445 5¢
Mechanical Properties of Metals and Alloys C447 $1.50
Metallic Cartridges R62-44 5¢
Packaging of Carriage, Machine, and Lag Bolts R60-43 5¢
List of Commercial Standards LC745 April 1, 1944

Federal Specifications Executive Committee (U. S. Treasury Department, Washington, D. C.)

Federal Specifications

(Copies available from Superintendent of Documents, Government Printing Office, Washington, D. C.)

Barrels; wood, tight (for liquids) NN-B-112 March 15, 1944
Bicycles KKK-B-286 April 1, 1944
Borers; cork GG-B-591 April 15, 1944
Brushes:
- Blackening and dauber (Amendment 1) H-B-131 March 15, 1944
- Dauber, long-paddle (Amendment 1) (superseding E-H-B-181, 9/10/42) H-B-181 March 15, 1944

Fitch, flat (Amendment 3) (superseding Amendment 2 and E-H-241, 2/17/42) H-B-241 March 15, 1944
Cloth; wire, screen (Amendment 2) (superseding Amendment 1 and E-RR-C451a, 10/20/41) RR-C-451a March 15, 1944
Cutters, glass; wheel-type (for sheet-glass and round-gage-glass) (superseding GGG-C-751) GGG-C-751 April 1, 1944
Dressing; leather, transmission-belt (Amendment 1) TT-D-636 March 15, 1944
Drills; hand (Amendment 1) (superseding E-GGG-D-671, 4/17/43) GGG-D-671 April 1, 1944
Gasoline; motor, United States Government (Amendment 1) VV-G-101a April 1, 1944
Hammers, mauls, and sledges (Amendment 2) GGG-H-86 March 15, 1944
Nails; spikes; staples; and tacks (Amendment 5) (superseding Amendment 4 and E-FF-N-101, 8/19/42) FF-N-101 April 15, 1944
Packing; flax, hemp, or cotton (superseding HH-P-106a, and E-HH-P-106a, 12/4/42) HH-P-106b April 15, 1944
Pipe-threads; taper (American-National) (superseding GGG-P-351) GGG-P-351a April 15, 1944
Plastics, organic; general specifications, test methods (superseding L-P-406) L-P-406a April 1, 1944
Soap; salt-water (Amendment 3) P-S-611a March 15, 1944
Steel, structural (including welding) and rivets; (for) bridges and buildings (Amendment 2) QQ-S-741 May 1, 1944
Tubing, rubber (Amendment 1) (superseding E-ZZ-T-831b, 6/5/43) ZZ-T-831b April 1, 1944

Varnish:
Asphalt (superseding TT-V-51) TT-V-51a April 1, 1944
Spar, water-resisting (Amendment 1) (superseding E-TT-V-121a, 2/10/43) TT-V-121b April 1, 1944
Wood-Preservative:
Celcure (acid-cupric-chromate) (Amendment 1) (superseding E-TT-W-546, 5/29/42) TT-W-546 March 15, 1944
Chromated-zinc-chloride (Amendment 1) (superseding E-TT-W-551, 5/29/43) TT-W-551 April 1, 1944
Coal-tar-creosote (Amendment 1) (superseding E-TT-W-556, 1/22/42) TT-W-556 April 1, 1944
Creosote-petroleum-solution (Amendment 1) (superseding E-TT-W-568, 1/22/42) TT-W-568 April 1, 1944
Recommended treating practice (Amendment 1) (superseding E-TT-W-571b, 5/29/42) TT-W-571b April 1, 1944
Wolman-salt (tanalith) (Amendment 1) (superseding E-TT-W-573, 5/29/42) TT-W-573 April 1, 1944
Wool, steel (Amendment 1) FF-W-556 April 1, 1944

War Food Administration (Washington, D. C.)

Canned Succotash, Tentative United States Standards for Grades of March 15
Frozen Spinach, Tentative United States Standards for Grades of March 15

Army Air Forces (Washington, D. C.)

Material and Process Specifications, Bulletin No. 23 March 10, 1944 (Supersedes issue of February 10, 1944)

Specifications Included In Army Training Course

A laboratory training program in the form of a series of seminars, just completed by the Engineering Division of the Jeffersonville Quartermaster Depot, included a discussion of specifications in connection with the various subjects considered. The seminars concerned themselves mainly with phases of the work which had been encountered in the laboratory, and the closely related question of specifications was brought into the discussion in relation to particular products. Available specifications in the field under consideration were studied for an over-all picture of test requirements and interpretation of results. The seminars considered such subjects as physical and chemical testing of plastics; testing, evaluation, and identification of metallic and non-metallic protective coatings; instrumental methods of analysis; testing, analysis, and significance of tests on paint, varnishes, lacquers, solvents, and thinners; laboratory standards as applied at the Jeffersonville Quartermaster Depot; and textile chemistry.

Officers of the Engineering Division at the Depot say that this method of training is proving of inestimable value not only to the individual, but also to the progress and efficiency of the Division and the Depot.

New ASA Company Members

The following twelve organizations have joined the American Standards Association as Company Members:

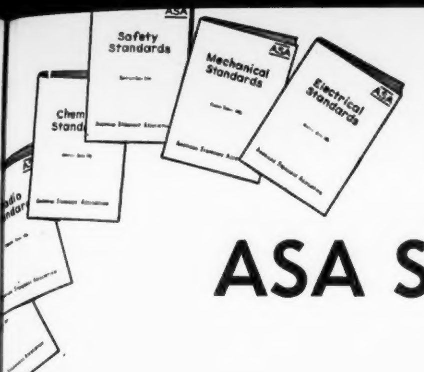
Eicor, Inc, Chicago, Illinois
Electronic Mechanics, Inc, Clifton, New Jersey
Foote, Pierson and Company, Newark, New Jersey
Edward I. Guthman and Company, Inc, Chicago, Illinois
The Hickok Electrical Instrument Company, Cleveland, Ohio
The W. L. Maxson Corporation, New York City
Meissner Manufacturing Company, Mt. Carmel, Illinois
Press Wireless Inc, Hicksville, Long Island, New York
Radio Frequency Laboratories, Inc, Boonton, New Jersey
Radio Specialty Manufacturing Company, Portland, Oregon
United Transformer Company, New York City
Western Sound and Electric Laboratories, Inc, Milwaukee, Wisconsin

As ASA members these companies will receive copies of the ASA monthly magazine, free copies of newly published standards, 20 percent discount on all American Standards, use of the library and information service, and direct and authoritative information about standardization projects.

To Distribute Standard Translations in Latin America

The National Electrical Manufacturers Association has made arrangements for the distribution throughout Latin America of a large number of copies of a Spanish edition of the National Electrical Code. The Association feels that the translation of this code will be helpful in promoting pan-American cooperation in standardization activities. These documents will be distributed by the Buenos Aires office of the Inter-American Department of the American Standards Association.

In addition to this publication made available by NEMA, the American Standards Association is publishing an edition of the American Standard Rotating Electrical Machinery (C50-1943) with an introduction in Spanish, and a second edition with an introduction in Portuguese. The Inter-American Department of the ASA will also distribute these editions in Latin-America.



ASA Standards Activities

American Standards

American Standards Available Since Our March Issue

Administrative Requirements for Building Codes A55.1-1944 35¢
Sponsors: American Municipal Association; Building Officials Conference of America
Building Code Requirements for Masonry A41.1-1944 50¢
Sponsor: National Bureau of Standards
Industrial Control Apparatus C19.1-1944 (AIEE 15, March 1944) 50¢
Sponsors: American Institute of Electrical Engineers; National Electrical Manufacturers Association
Refrigerators B38
Sponsors: American Society of Refrigerating Engineers; U. S. Department of Agriculture, Bureau of Human Nutrition and Home Economics
Food-Storage Volume and Shelf Area of Automatic Household Refrigerators, Method of Computing B38.1-1944 20¢
Household Electric Refrigerators (Mechanically Operated), Test Procedures for B38.2-1944 30¢
Rotation, Connections and Terminal Markings for Electrical Apparatus C6.1-1944 $1.00
Sponsor: National Electrical Manufacturers Association
Safety Code for Woodworking O1.1-1944 35¢
Sponsors: International Association of Industrial Accident Boards and Commissions; National Conservation Bureau
Zinc Coating of Iron and Steel G8
Sponsor: American Society for Testing Materials
Zinc-Coated (Galvanized) Iron or Steel Barbed Wire G8.10-1944 (ASTM A121-39) 25¢
Zinc-Coated (Galvanized) Iron or Steel Farm-Field and Railroad Right-of-Way Wire Fencing G8.9-1944 (ASTM A116-39) 25¢
Zinc-Coated (Galvanized) Iron or Steel Telephone and Telegraph Wire G8.3-1944 (ASTM A111-43) 25¢
Zinc-Coated Steel Wire Strand (Class B and Class C Coatings) G8.11-1944 (ASTM A218-41) 25¢

American Standards Approved Since Our March Issue

Electrical Insulating Materials C59
Sponsor: American Society for Testing Materials
Electrical Insulating Oils, Method of Testing C59.2-1944 (ASTM D117-43)
Impact Resistance of Plastics and Electrical Insulating Materials C59.11-1943 (ASTM D256-43T)
Graphical Symbols for Electronic Devices Z32.10-1944
Sponsors: American Institute of Electrical Engineers; American Society of Mechanical Engineers
Socket Set Screws and Socket Head Cap Screws, Supplement to B18.3a-1944
Sponsors: American Society of Mechanical Engineers; Society of Automotive Engineers

Standards Being Considered by ASA for Approval

Lightning Arresters C62.1 (AIEE No. 28)
Sponsor: American Institute of Electrical Engineers
Motion Pictures Z22
Sponsor: Society of Motion Picture Engineers
Cutting and Perforating Negative Raw Stock (35-mm) Z22.34
Cutting and Perforating Positive Raw Stock (35-mm) Z22.36
Raw Stock Cores (35-mm) Z22.37
Raw Stock Cores (16-mm) Z22.38
Screen Brightness Z22.39

Standards Submitted to ASA Since Our March Issue

Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)
Sponsors: American Society of Mechanical Engineers; Heating, Piping, and Air Conditioning Contractors National Association; Manufacturers Standardization Society of the Valve and Fittings Industry

American War Standards

American War Standards Approved and Published Since Our March Issue

Protective Occupational Footwear Z41
Men's Safety Shoes
Men's Safety-Toe Shoes Z41.1-1944
Men's Conductive Shoes Z41.3-1944
Men's Explosives-Operations (Non-sparking) Shoes Z41.4-1944
Men's Electrical-Hazards Shoes Z41.5-1944
} In one volume 40¢
Women's Safety Shoes
Women's Safety-Toe (Oxford) Shoes Z41.2-1944
Women's Safety-Toe (High) Shoes Z41.7-1944
Women's Explosives-Operations (Non-sparking) Shoes Z41.8-1944
Women's Conductive Shoes Z41.9-1944
} In one volume 40¢

List of American War Standards

Accuracy of Engine Lathes B5.16-1941 25¢
Allowable Concentrations of Toxic Dusts and Gases Z37
Cadmium Z37.5-1941 20¢
Manganese Z37.6-1942 20¢

List of American War Standards—(Continued)

Allowable Concentrations of Toxic Dusts and Gases—(Continued)

Metallic Arsenic and Arsenic Trioxide Z37.9-1943 20¢
Styrene Monomer Z37.15-1944 20¢
Xylene Z37.10-1943 20¢
Clothing—*See* Protective Occupational (Safety) Clothing; Women's Industrial Clothing
Code for Electricity Meters (Revision of Paragraph 827) C12WS-1942 10¢
Color, Specification and Description of Z44-1942 25¢
Domestic Gas Ranges, Approval Requirements Z21.1ES-1942 $1.00
Dry Electrolytic Capacitors (Home Receiver Replacement Type) C16.7-1943 20¢
Electrical Measuring Instruments C39
Electrical Indicating Instruments ($2\frac{1}{2}$- and $3\frac{1}{2}$-Inch, Round, Flush-Mounting, Panel-Type) C39.2-1943 50¢
External Ammeter Shunts for Panel-Type Instruments C39.5-1943 25¢
Shock-Testing Mechanism for Electrical Indicating Instruments ($2\frac{1}{2}$- and $3\frac{1}{2}$-Inch, Round, Flush-Mounting, Panel-Type) C39.3-1943 25¢

List of American War Standards—(Continued)

Dimensions for External Radio-Frequency Thermocouple Converters (120 Milliamperes to 10 Amperes, Inclusive) C39.4-1943 10¢
Gas Water Heaters, Approval Requirements Z21.10WS-1942 $1.00
Machine Tool Electrical Standards C74-1942 40¢
Military Radio Equipment and Parts C75
Ceramic Radio Insulating Materials, Class L C75.1-1943 20¢
Ceramic Radio Dielectric Materials, Class H C75.4-1943 20¢
Crystal Unit CR-1 ()AR C75.11-1944 25¢
Dynamotors C75.13-1944 35¢
External Meter Resistors (Ferrule Terminal Styles) C75.5-1943 25¢
Fixed Ceramic-Dielectric Capacitors C75.12-1944 35¢
Fixed Composition Resistors C75.7-1943 60¢
Fixed Mica-Dielectric Capacitors C75.3-1943 50¢
Glass Radio Insulators C75.8-1943 50¢
Glass-Bonded Mica Radio Insulators C75.6-1943 25¢
Porcelain Radio Insulators C75.14-1944 50¢
Power-Type Wire-Wound Rheostats C75.9-1944 50¢
Steatite Radio Insulators C75.2-1943 50¢
Toggle Switches C75.15-1944 50¢
Variable Wire-Wound Resistors (Low Operating Temperature) C75.10-1944 40¢
Photographic Exposure Computer Z38.2.2-1942 $1.00
Pressure Ratings for Cast-Iron Pipe Flanges and Flanged Fittings, Class 125 B16a1-1943 10¢
Pressure-Temperature Ratings for Steel Pipe Flanges, Flanged Fittings, and Valves (Revision of Tables 6 to 11, inclusive, American Standard B16e-1939) B16e5-1943 25¢
Protective Lighting for Industrial Properties A85-1942 50¢
Protective Occupational (Safety) Clothing L18
Leather Aprons L18.1-1944 formerly Z51.1-1944
Leather Cape Sleeves and Bibs L18.2-1944 (formerly Z51.2-1944)
Leather Leggings (Knee Length) L18.3-1944 (formerly Z51.3-1944)
In one volume 30¢
Quality Control Z1
Guide for Quality Control Z1.1-1941
Control Chart Method of Analyzing Data Z1.2-1941
In one volume 75¢
Control Chart Method of Controlling Quality During Production Z1.3-1942 75¢
Replacement Parts for Civilian Radio C16
Dry Electrolytic Capacitors (Home Receiver Replacement Type) C16.7-1943 20¢
Fixed Paper-Dielectric Capacitors (Home Receiver Replacement Type) C16.6-1943 20¢
Home Radio Replacement Parts Simplified List C16.8-1943 20¢
Power and Audio Transformers and Reactors (Home Receiver Replacement Type) C16.9-1943 25¢
Straight Screw Threads for High-Temperature Bolting B1.4-1942 25¢
Women's Industrial Clothing L17
Bungalow Aprons, and Wrap-around and Coat Style Dresses L17.1-1944 25¢

List of American War Standards—(Continued)

Women's Industrial Clothing—(Continued)

Jackets, Shirts, and Aprons L17.3-1944 25¢
Regular and Princess Model Coat Style Dresses L17.4-1944 20¢
Slacks, Dungarees, Overalls, and Coveralls L17.2-1944 25¢

War Standards Under Way

Color Code for Lubrication of Machinery Z47
Cylindrical Fits B4
Electrical Graphical Symbols, Coordination of Z32.11
Machine Tool Electrical Standards Revision of C74-1942
Military Radio Equipment and Parts C75
Capacitors
Fixed Paper-Dielectric Capacitors (Hermetically Sealed in Metallic Cases) C75.16
Packages for Electronic Tubes Z45
Photography and Cinematography Z52
Specifications for Class J Service-Model 16-mm Sound Motion Picture Projection Equipment Z52.1
Method of Determining Freedom from Travel Ghost in 16-mm Sound Motion Picture Projectors Z52.4
Method of Determining Resolving Power of 16-mm Motion Picture Projector Lenses Z52.5
Method of Determining Picture Unsteadiness of 16-mm Sound Motion Picture Projectors Z52.6
Specifications for Multi-Frequency Test Film Used for Field Testing of 16-mm Sound Motion Picture Projection Equipment Z52.8
Specifications for 3,000-Cycle Flutter Test Film For Testing 16-mm Sound Motion Picture Projection Equipment Z52.10
Sound Track Focusing Test Films for 16-mm Sound Motion Picture Projectors Z52.11
Specifications for 400-Cycle Signal-Level Test Film for 16-mm Sound Motion Picture Projector Equipment Z52.17
Protective Occupational (Safety) Clothing L18 (Formerly Z51)
Leather Coats L18.4/45
Leather Overalls L18.5/46
Leather Sleeves L18.6/47
Welders' Leather Gauntlet Gloves L18.7/38
Protective Leather Gloves, Steel Stapled L18.8/39
Asbestos Gloves L18.9/40
Asbestos Gloves, Leather Reinforced L18.10/41
Asbestos Mittens L18.11/42
Asbestos Mittens, Leather Reinforced L18.12/43
Women's Safety and Powder Caps L18.13/44
Replacement Parts for Civilian Radio C16
Volume Controls (Home Receiver Replacement Type) C16.10
Resistance Welding Equipment C52
Electrodes C52.3
Specifications for Design and Construction of Resistance Welding Equipment C52.4
Safety in Electric and Gas Welding and Cutting Operations Z49
Screw Threads B1
Acme Screw Threads for Special Purposes B1.5
Screw Threads of Truncated Whitworth Form B1.6

News of ASA Projects

Allowable Concentrations of Toxic Dusts and Gases (Z37)—

The proposed American Standard Allowable Concentration of Formaldehyde has been approved by the sectional committee and will, it is expected, be submitted to the ASA for approval in the near future.

A new subcommittee has been appointed to work on the development of a standard for the permissible concentration of radium dust, and safe limits of exposure to radon gas, and gamma rays in workplaces. Dr. Leonard Greenburg, Executive Director, Division of Industrial Hygiene, New York Department of Labor, is chairman of the new subcommittee.

Code for Protection Against Lightning (C5)—

Sponsors: American Institute of Electrical Engineers; National Bureau of Standards

The joint sponsors of this project have recommended to the ASA the appointment of the National Fire Protection Association as a third sponsor. The proposal is being submitted to the Electrical Standards Committee, which under the ASA By-Laws has the authority to designate additional sponsors for a project under its jurisdiction.

Coordination of Dimensions of Building Materials and Equipment (A62)—

Sponsors: American Institute of Architects; Producers' Council

The Executive Committee of this sectional committee met March 24 and voted to approve a pamphlet for architects explaining the principles of dimensional coordination and their application to building design. The pamphlet will be issued following editing by the Editing Committee.

The Executive Committee voted that a new study committee on open steel flooring should be organized under the regular procedure of the A62 committee. It also confirmed the organization of Study Committee 11 on Cast-in-Place Concrete, and voted to organize Study Committee 12 on Window Accessories.

A proposed American Standard Basis for the Coordination of Dimensions of Building Materials and Equipment, A62.1, and a proposed American Standard Basis for the Coordination of Masonry, A62.2, have already been distributed for comment and criticism.

The next meeting of the Executive Committee is scheduled for June 9.

Protective Occupational (Safety) Clothing (L18)—

A meeting of the subcommittee on hand protection, held March 28, considered comments and criticisms received on six draft standards as the result of a canvass of the groups concerned. These drafts covered Welders' Leather Gauntlet Gloves, L18.7; Protective Leather Gloves, Steel Stapled, L18.8; Asbestos Gloves, L18.9; Asbestos Gloves, Leather Reinforced, L18.10; Asbestos Mittens, L18.11; Asbestos Mittens, Leather Reinforced, L18.12. Revised drafts of these proposed American War Standards are now being sent to letter ballot of the War Committee.

The proposed American War Standards on Leather Coats, L18.4; Leather Overalls, L18.5; and Leather Sleeves, L18.6 are now out to final vote of the War Committee.

The subcommittee on garments of leather, asbestos, wool, and flame-resistant fabrics met on March 23, and considered several standards on asbestos clothing which are now being prepared before being sent out to canvass for comment and criticism.

Work was started by the subcommittee on garments of coated and impregnated fabrics at a meeting March 31.

Resistance Welding Equipment (C52)—

A proposed American War Standard on electrodes is now being revised in line with comments and criticisms received as the result of a canvass by the Subcommittee on Resistance Welding Electrodes, Electrode Holders, and Seam Welder Bearing Shafts and Bushings. These comments were reviewed by the subcommittee at its meeting February 17.

A new subcommittee has now been appointed to review the criticisms received as the result of a canvass on specifications for design and construction of resistance welding equipment.

Safety in Electric and Gas Cutting and Welding Operations (Z49)—

Following approval by the ASA War Committee, the proposed American War Standard for Safety in Gas and Electric Welding and Cutting Operations is now before the Safety Code Correlating Committee. The SCCC is voting on whether to recommend approval of the proposed War Standard to the chairman of the ASA Standards Council.

Standardization in the Field of Photography (Z38)—

Sponsor: Optical Society of America

A letter ballot is being taken by this committee on six proposed American Standards: Specifications for Films for Permanent Records, Z38.3.2; Back Window Location for Roll Film Cameras, Z38.4.9; Threads for Attaching Mounted Camera Lenses to Photographic Equipment, Z38.4.11; Attachment Thread Specifications for Camera Lens Accessories, Z38.4.12; Distance (Focusing) Scales Marked in Meters, Z38.4.13; Picture Sizes for Roll Film Cameras, revision of Z38.4.8-1943.

Truncated Whitworth Threads (B1.6)—

A revised draft of this proposed American War Standard has been sent to the ASA War Committee for approval and to a general canvass of industry for comments before submittal of the standard to the ASA for final approval.

Special Qualifications For Writing Specifications

"Specification writing is no drudgery. It may seem very specialized, but actually it touches upon many fields. The specification writer must know English, and how to express himself. He must be familiar with materials, and with manufacturing and construction practices, and must know the various national standardization organizations and their publications. He must likewise be familiar with contract law. And, of course, he must have practical experience coupled with good common sense.

"The larger governmental and private organizations should organize their engineering work so that young men will be given adequate training in specification writing. The office should be supplied with a well-equipped library of national standard specifications, and the specification writers should be sent on frequent trips to the construction project. We might then be able to rid ourselves of much bad practice, and obtain specifications that would benefit the consumer, the engineer, the producer, and the contractor alike."

—From "Why Specifications?" by Rolf T. Retz, *Civil Engineering,* October, 1943.

Color Names for Lights Needed

The war has made urgent the need for a system of color names for describing lights, states a recent news item in the *Technical News Bulletin,* published by the National Bureau of Standards. Conflicting names are often used in describing the colors of flares, landing lights and beacons, signal lights, and fluorescent and phosphorescent materials used in the landing fields of the world and in plants busy with the production of war supplies, the article explains.

As a suggestion for such a standard system, a tentative extension of the Inter-Society Color Council–National Bureau of Standards system of color names for describing the colors of drugs and medicines has been worked out for lights and is described by Kenneth L. Kelly, research associate of the American Pharmaceutical Association, in the November, 1943, issue of the *Journal of Research* (RP1565). High-value hue names such as red, pink, and bluish purple are used, but not those of low value, such as brown or olive. The modifiers of color names, such as pale, weak, or brilliant, are omitted because the conditions of viewing vary to such a degree that the problem is usually one of separating lights of different hues. The hue names are those used in the ISCC-NBS system and carry the same meaning.

The paper includes a comparison with the standard colors recognized in various specifications for marine, railway, aviation, and highway traffic signal glasses.

ASA Meetings

Meetings of the ASA Board of Directors and Standards Council are scheduled for the year 1944 as follows:

Board of Directors	*Standards Council*
Friday, May 19	Thursday, May 18
Friday, September 22	Thursday, September 21

Actual dates for the December Board and Standards Council meetings, and also for the Annual Meeting, have not as yet been set. These will be announced later.